

QUIVIRA NWR
NARRATIVE REPORT - 1967

QUIVIRA NATIONAL WILDLIFE REFUGE

STAFFORD, KANSAS

PERSONNEL

Refuge Manager - - - - - Charles R. Darling

Assistant Refuge Manager - - - - - Michael B. Brownlee
(Transferred to Horicon NWR 06/17/67)

Assistant Refuge Manager - - - - - James M. Carroll, Jr.
(Transferred from Tishomingo NWR 08/13/67)

Refuge Clerk - - - - - Wayne E. Dale

Maintenanceman - - - - - Earl Miller

Maintenanceman - - - - - Darrell Keesling
(Transferred to Bear River MBR 04/17/67)

Maintenanceman - - - - - Louis Wilson
(From Laborer, Farm to Maintenanceman 06/18/67)

Laborer, Farm (WAE) - - - - - Phillip McNaughton
(Term. 02/28/67)

Laborer, Farm (WAE) - - - - - Harvey Keesling
(01/31 - 04/07/67)

Laborer (WAE) - - - - - Kevin Welsh
(04/10 - 21/67)

Laborer (WAE) - - - - - Jacky Burleson
(05/06 - 09/08/67)

Laborer (WAE) - - - - - Kenneth King
(05/06 - Present)

Laborer (WAE) - - - - - Tom Peintner
(05/31 - 08/26/67)

Laborer (WAE) - - - - - Mike Forwalder
(06/01 - 09/01/67)

Laborer, Farm (WAE) - - - - - Keith Starr
(06/05 - 09/08/67)

Laborer, (WAE) - - - - - Randy Stalcup
(06/05 - 09/08/67)

Laborer, (WAE) - - - - - Ben Linville
(07/17 - 08/26/67)

Student Aid (YOC) - - - - - Jody Burleson
(07/19 - 08/26/67)

QUIVIRA NATIONAL WILDLIFE REFUGE
STAFFORD, KANSAS
NARRATIVE REPORT
JANUARY 1 to DECEMBER 31, 1967

INDEX

I.	GENERAL	
	A. Weather Conditions	1
	B. Habitat Conditions	1
II.	WILDLIFE	
	A. Migratory Birds	2
	B. Upland Game Birds	4
	C. Big Game Animals	4
	D. Fur Animals, Predators, Rodents & Others	4
	E. Eagles, ^H awks, Owls and Crows	5
	F. Other Birds	5
	G. Fish	6
	H. Reptiles and Amphibians	6
	I. Disease	6
III.	REFUGE DEVELOPMENT AND MAINTENANCE	
	A. Physical Development	6
	B. Plantings	8
	C. Collections and Receipts	9
	D. Control of Vegetation	9
	E. Planned Burning	9
	F. Fires	9
IV.	RESOURCES MANAGEMENT	
	A. Grazing	10
	B. Haying	10
	C. Other Uses	10
V.	FIELD INVESTIGATION OR APPLIED RESEARCH	
	A. Progress Report	11
VI.	PUBLIC RELATIONS	
	A. Recreational Use	11
	B. Refuge Visitors	11
	C. Refuge Participation	13
	D. Hunting	13
	E. Violations	13
	F. Safety	15
VII.	OTHER ITEMS	
	A. Items of Interest	15
	B. Photographs	16

QUIVIRA NATIONAL WILDLIFE REFUGE

STAFFORD, KANSAS

NARRATIVE REPORT

JANUARY 1 to DECEMBER 31, 1967

I. GENERAL

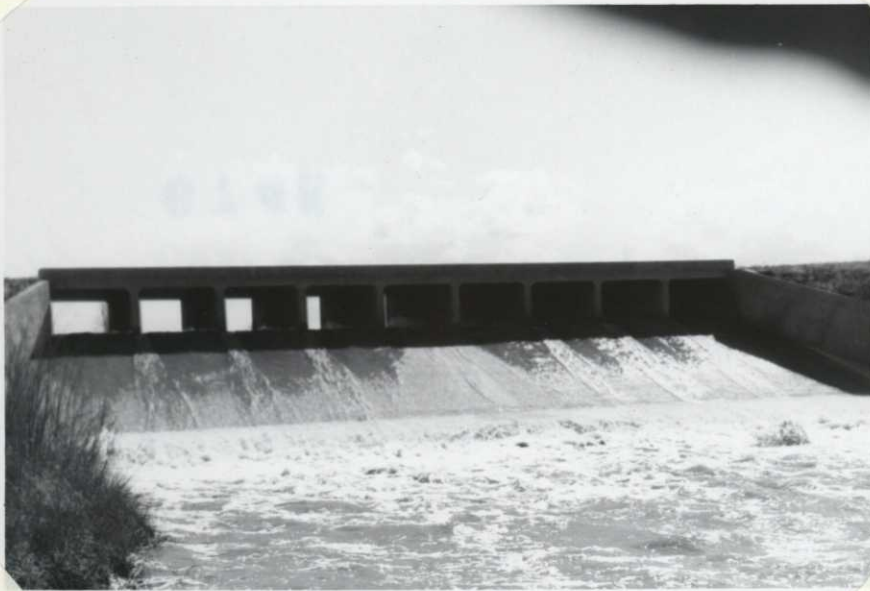
A. Weather Conditions.

Headquarters							
<u>Month</u>	<u>Snow</u>	<u>Precip.</u>	<u>Precip.</u>	<u>Ave. Precip.</u>	<u>Max. Temp.</u>	<u>Min. Temp.</u>	
Jan.	3.5"	.41"	.20"	.68"	76°		0°
Feb.		.01	.00	.91	79		10
March	.2	.25	.36	1.21	84		0
April		4.00	3.59	2.39	92		28
May		1.78	1.77	3.90	97		31
June		9.24	9.25	3.80	93		50
July		2.26	4.68	3.03	101		54
August		.53	1.65	2.90	101		40
Sept.		3.79	1.37	1.81	90		39
Oct.		1.17	1.73	1.33	93		30
Nov.	1.0	.59	.67	.86	74		20
Dec.	6.5	.91	.84	.81	65		3
Totals	11.2"	24.94"	26.11"	23.63"	Extremes 101°		0°

Precipitation and temperature data were taken from the U. S. Weather Bureau station at Hudson, Kansas. Precipitation records, including melted snow, were also made at refuge headquarters. Average precipitation figures are for the period 1931-52. This years growing period, date of last killing frost and date of first killing frost were very close to the average of previous years. As the year began we were experiencing near drought conditions. Melting snow relieved the situation slightly but conditions remained poor until the arrival of 3.47" of rain in April. For the remainder of the year ground moisture was, in general, adequate. Harvests and plantings were inhibited at times by wet fields. Several low temperature records were broken during July and August making these months unusually pleasant.

B. Habitat Conditions.

1. Water. Water flow from Rattlesnake Creek was below normal early in the year but remained adequate to our needs. Freezing temperatures restricted the flow of water to desired units in early spring. There was no release of water beyond Darrynane Lake, Unit 24, into Rattlesnake Creek from early August until the end of November. Water was started into various units on August 31 in preparation for the fall migration. Water impounded in Unit 5 was adequate to operate all canals at maximum levels if desired. However, flow was restricted in some places by weeds blown into the canals, vegetative growth in shallow ditches and siltation.



June rains filled Little Salt Marsh
(Unit 5) and Rattlesnake Creek flows
on from Darrynane Lake. 6/67 CRD



Unit 5 was maintained at one and one-half feet below the full mark in the event of a sudden summer flood and later for pending construction work. The storage provided water to fill units 10a, b, c & d, 11, 14a, b & c, 16, 20a & b, 21, 22, 23, 24, 28, 29, 30, 40, 48, 49 and Dead Horse Slough. Units 7, 26 and 62 were partially filled. The flow of Rattlesnake Creek increased to an estimated 25 cfs in November and refilled Unit 5 to the desired level before the December freeze. Unit 25 was not filled because of some needed canal repair and units 61 and 63 were deferred because of uncertain construction plans and the depletion of storage reserves. Many of the units were dry or only contained water in the borrow ditches in early August; consequently nearly four months were required to fill them as desired.

2. Food and Cover. Some wind erosion was noted on fields with insufficient cover during the first three months of the year. Rainfall beginning in April gave our grasslands the needed boost eventually yielding excellent cover for upland game production. Canada geese made intermittent use of wheat in farming units A-1, 2, 4, 6 & 7 and Tracts 46, 50 and 103. Tract 46 received the earliest and heaviest use. Unit A-6 and Tract 50 were included in the hunting units; consequently they were not heavily used until after the hunting season. Eight acres of Elbon rye just north of the Little Marsh were grazed down completely by Canada geese. Its proximity to the Little Marsh may have been the major reason for their feeding there. Large concentrations of mallards were observed feeding on strip-harvested milo in Unit A-4.

Early duck migrants fed heavily on the Japanese millet (Echinochloa crusgalli) planted in Units 48 and 49. Numerous mallards were seen feeding on milo left standing in strips in farming unit A-4. Units 28, 29, and 30 were popular with the ducks and provided some of the best hunting in our newly opened hunting areas. Unit 26 was flooded late in the season and was intensively used until it froze over. The Big Salt Marsh was a popular resting spot for early migrants but by the middle of November most ducks were using the Little Salt Marsh (Unit 5) as a base of operations. Spectacular evening feeding flights of 40,000 to 50,000 ducks to surrounding croplands was remarked upon by numerous persons. Several old timers commented that they had never seen as many ducks in this area before.

II. WILDLIFE

A. Migratory Birds.

Geese. The new year arrived with 1,850 Canada geese using the refuge as compared to 7,500 at that time last year. The spring buildup peaked at 4,100 vs. 16,500 for 1966 dropping our use-days by sixty-four percent (719,432 to 257,502) for that period. White-fronted goose numbers were also down peaking at 1,883 vs. 14,500 for 1966 with use-days down eighty percent (230,251 to 47,152).

The fall build-up of Canada geese started in mid-October, two weeks earlier than last year, rising to 4,800 during the first week of



Mallards over Little Salt Marsh. 11/67 CRD

December and tapering off to 1,650 by the third week. The last week of December arrived with 6,637 Canada geese present to help us greet the new year. In spite of a forty-four percent increase in the fall population over last year our total goose use-days for the year was roughly half that of 1966.

Ducks. The spring mallard migration peaked at 54,025 which was 35,275 less than last year; however their length-of-stay increased the use-days for this species by nearly 500,000 over the same period last year. Pintails peaked at 30,000 or 70,000 below last year and their use-days were down 768,222. Green-winged teal didn't start passing through until the middle of March with use-days down ninety-four per cent from last year. Blue-winged teal were also later but their use-days showed a slight increase.

The divers generally followed last year's spring migration pattern. Ring-necked ducks were the exception with a peak of 490 compared to none during the same period last year.

During the fall migration, mallard numbers rose faster than last year but stopped at 52,956 while in 1966 they increased to 82,700. This year's peak population was present up to the last week in December when it suddenly dropped to 81 as the Little Salt Marsh froze and fields were covered with snow. Mallard use-days for the year were down only slightly from last year. Green-winged teal use-days dropped thirty-four percent from the fall period of last year.

Duck use-days for the fall migration were down twenty percent from last year. Dabbler use-days were down about twenty-one percent, whereas the diver use increased one hundred twenty-seven percent.

Other Migratory Birds. Two whooping cranes were seen ten miles south of the refuge on March 31. These birds were in the area about an hour before taking off, seeking altitude and heading north. Four whooping cranes were sighted October 26 on Unit 5. Three of these birds were definitely adults, while the age of the fourth could not be definitely determined. These birds were flushed by four hunters, trespassing on a closed section of the refuge, and flew to the northwest in the general direction of the Big Salt Marsh. A search was made but the birds were not seen on the area again. If they or new arrivals had been sighted, hunting on the refuge would have been discontinued during their stay.

Sandhill cranes seemed to prefer utilizing hay meadows northwest of the refuge. Use-days (23,096) were down eighty-six percent from last year's record high of 160,000. Least and Baird's sandpipers were also down from last year's record populations. Peak populations for these two species were 60 and 90 vs. 1,750 and 1,550 for last year.

Last year production on the refuge was limited to several young killdeer and about 600 mourning doves. This year piebilled grebes produced

fifty young, killdeer fifty young, green heron twenty young and mourning dove approximately 1,800 young.

B. Upland Game Birds.

Bobwhite and ring-necked pheasant populations continued at the high levels attained last year. Weather and habitat conditions were conducive to good production and, while we have not as yet any formal census techniques, production was estimated to be equal to last year. Dense ground cover assures protection as was illustrated by large numbers of these birds moving across roads and open hay meadows following the hunting season.

C. Big Game Animals.

Sightings of white-tailed deer are common around the north side of Unit 5. The dense thicket of Salt Cedar on this side of the unit seems to be their focal point. Other groups of trees around the refuge support smaller concentrations such as the 6-8 deer frequently seen around headquarters. This year's refuge deer population stands at approximately 80 individuals.

D. Fur Animals, Predators, Rodents and Other Mammals.

Beaver activity this past year was noted primarily around units 10a and 10b and Rattlesnake Creek at its closest point to these units. At unit 10b they constructed a dam to supplement our flashboards. This constituted no major problem as water movement through this point is not critical; however removal of the dam could well have been considered a major project by the college boys who labored on it. A three foot high dam was built on Rattlesnake Creek at the point mentioned above. The creek banks are about nine feet high at this spot so again there was no problem, in fact, the section of creek above the dam is about the last water to freeze over in the winter and receives much use by wintering mallards.

Several muskrat houses could be seen on units 20a and 23. Muskrats have been sighted at several other spots on the refuge but cannot yet be considered abundant.

Badgers, pocket gophers (Geomys bursarius) and kangaroo rats (Dipodomys ordii) caused minor problems to dikes, canal banks, roadways and lawns with their burrowings.

Black-tailed jackrabbits were seen occasionally and seem to be increasing slightly. Eastern cottontails are common on the southern half of the refuge. Striped skunks are abundant over the entire refuge.

A southern bog lemming (Synaptomys cooperi) was found under some debris on the west side of unit 5. It was brought into the office for identification and later released. Species determination was made without

reference to probable grooves on its incisors. Tail length was relied on to determine that it was not a prairie vole (Microtus ochragaster).

Coyotes can still be seen and heard, no thanks to a \$2.00 bounty on them on lands surrounding the refuge. Several dead coyotes were found, minus their ears, on or next to the refuge. It is hoped the collectors were only after the bounty and did not think they were doing us a favor.

There are five blacktail prairie dog towns within the refuge boundaries covering approximately twenty seven acres. The colony in Section 26, northwest of unit 5, covers about six acres.

E. Hawks, Eagles, Owls, Crows.

Eagle numbers dropped again this year from the sixty-two seen in February 1965. Last year began with thirty-one present while this year we were down to twenty-three. This years fall migration consisted of six golden eagles and fourteen bald eagles. Again, as last year, most of these birds were immature which would seem to be encouraging. One large, lone tree on the Little Salt Marsh provided a perch for as many as six eagles at one time. It was interesting to see a young bald eagle pass within fifty feet over the heads of hundreds of Canada geese sitting on open water and settle on the ice near them without causing any geese to fly off.

Marsh hawks passing low over the grasslands were a familiar sight throughout the fall and winter months. Approximately seventy-five Swainson's hawks were seen south of the refuge at dusk on October 1 on their southward migration. Thirty-five of this species were summer residents. Sparrow hawks were commonly seen. One flew inside a storage building and was caught with a hand net and released. This is quite an impressive little hawk.

Great horned and short-eared owls were noticeable when time and place were right. Burrowing owls are still common in the prairie dog towns.

An estimated population of 5,000 crows fed and roosted on the refuge in early October. They and about 50,000 red-winged blackbirds virtually stripped the standing milo left by cooperative farming in some fields. Crows remained abundant in surrounding areas but did not concentrate on the refuge in November and December.

F. Other Birds.

No significant population changes were noted among other bird species. The Audubon Christmas Bird Count, included at the end of this report, was down roughly 70,000 birds from last year's total. The primary cause of this was the drop in mallards from 74,212 last year to 81 this year and red-winged blackbirds dropped from 802 to 24. Thirty-five

species were counted this year versus thirty-eight last year. The common gallinule was added to the refuge bird list when Refuge Clerk Wayne Dale picked up a dead bird on an interior road. The bird had apparently flew into a telephone line during the early morning fog of July 6.

G. Fish.

The Little Salt Marsh (Unit 5) and large pools along Rattlesnake Creek are the only spots on the refuge where fish may be found regularly throughout the year. Some fish, of course, move along the canals into other water units as they are flooded but are lost when these units are drained or dry up. Channel catfish, black bullheads and carp are the most often seen species at water control structures.

H. Reptiles.

Western Massasaugas (Sistrurus catenatus), the only poisonous snake on the refuge, common hog-nosed snakes (Heterodon platyrhinos) and western hog-nosed snakes (Heterodon nasicus) were frequently encountered during the summer around refuge residences. Similar pattern and coloration of live immatures of these species required a cautious identification procedure. A lack of rattles proved nothing and neither, at times, did the profile of the nose. If, while staring into its pin-head size eyes, it was decided that vertical pupils were staring back, the reaction of the observer was the best confirmation.

A tiger salamander (Ambystoma tigrinum) was seen early one evening feeding on insects under a porch light. There were no other unusual reptile sightings.

I. Disease.

Nothing to report.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development & Maintenance.

Construction progress hit a legal and then a budgetary snag. Bid invitations were solicited for constructing the Rattlesnake - Big Salt Marsh Canal and Units 58, 75 and 76 in June from FY 67 construction funds. An error in the submission of the lowest bid was ruled as "no bid" by the solicitor's office. The bids were resolicited in September but the contract was not awarded before the end of the year because of the freeze on fund expenditures. No construction monies were available for FY 68.

One and one-half mile of boundary fence was constructed in Sec. 14, T21S, R11W. to facilitate grazing without the need of an electric

fence. One mile of interior pasture fence was replaced along the west side of Tract 80 and 3,000 feet of fence were constructed to exclude cattle from canals and dikes in Tract 52. These fences and canceling the use of several pastures where recent construction had been performed, eliminated the problem of maintaining fifteen or more miles of electric fence during the grazing season. Five and three-quarter miles of old and unused fences were removed.

The living room, dining room and bedroom walls of Q-56 were stripped and sheetrocked to prevent moisture condensation and increase insulation efficiency. The walls of these rooms were painted and the floors were cleaned. Central air conditioning was installed in residences Q-261 and Q-262. A new pipe and point were put on the water pump at the shop and the electric pump was overhauled.

The well and windmill on Tract 80 were moved to a central location in the grazing unit. A windmill was erected over an already existing 16" well casing in the grazing unit on Tract 46a and a new pipe and point were installed for the windmill on Tract 96.

Repairs were made on feeder canal banks to Units 40 and 62. About 300 cu. yds. of fill material were placed on eroded sections of dike in Units 5, 24 and 49. Six free loads of brick rip-rap were hauled from Stafford to Darrynane Lake to be placed around the control structures. An old stone chimney, concrete floors, and a concrete water tank from a former farm residence were all reduced to rip-rap material.

Both sides of 4.3 miles of canal and 1.5 miles of dike were mulched with the Finn Mulch Spreader. Bermuda grass was planted on the Unit 24 dike.

✓ The Unit 5 (Little Salt Marsh) dike and the entrance road from the east boundary to the dike were graded prior to the application of gravel. A contract was granted to the Klepper Sand Co. to haul and tail-gate spread 4,300 cu. yds. of sand-gravel-clay material to this section of road and the entrance road and dike of Unit 24 (Darrynane Lake). This was done in preparation to the opening of a portion of this area to fishing and public traffic. The comparative short haul and cheap material was an opportune time to utilize the refuge dump truck to haul 390 cu. yds. of material to the headquarters roads, public parking areas and various washouts on dike and ditch banks during the contract.

Two miles of a north-south township road, common to Sections 26 and 27 and Sections 34 and 35, T21S, R11W, were formally closed. Aluminum gates were placed across each end of the road prior to the hunting season. An additional $4\frac{1}{4}$ miles of road, which are no longer maintained by the township, have been approved for closure by the county commissioners. Formal publication was awaiting action by the county attorney at the end of the year.

A 110 volt generator was installed on the Dodge Powerwagon to permit



Good stand of Japanese millet from hand
broadcasting on mud flats of Unit 48 in
late July. Stand was mature in early
September. Seed apparently still available
after flooding in October as it appeared
to be a favorite spot for ducks. 9/67 CRD

the use of a power wrench to help raise gates on water control structures. This generator was used, with an impact wrench, to post Public Hunting Area signs and speeded up this operation considerably.

Bids were accepted on six lots of old buildings including twenty items which sold for \$122.00. The progressive removal of the unsightly structures is of greater value than the monetary return.

B. Plantings.

1. Aquatic and Marsh Plants. Five acres of mud flats in Unit 49 were planted with Japanese millet at the rate of twenty pounds per acre. We were unable to dry out the units for mechanical planting before the end of July because of abundant rainfall and resorted to hand broadcasting. The results were very satisfactory even though the stand matured earlier than expected or necessary.

2. Trees and Shrubs. Twelve silver maple trees and an assortment of shrubs were planted at headquarters to improve the appearance of the area.

3. Upland Herbaceous Planting. The dikes and canals which were mulched, were also planted with a mixture of one-half pound weeping lovegrass, one pound sand love, one and one-half pounds blackwell switchgrass and one-half pound alfalfa seed at the rate of six pounds per acre.

4. Cultivated Crops. The cultivation of fields for planting sorghum grain was started in late May and continued into early June. Approximately forty acres of milo were planted between rains in June but most of this had to be replanted. Rains were received on twenty-two days during June and July for a total of 13.93 inches at headquarters and, as common with summer rains, sometimes more was received on various fields. A total of 115 acres was planted to milo and about half of this was of an earlier maturing variety in an attempt to beat the frost date. Cool weather in August retarded growth and very little mature grain was produced from the refuge plantings. Cooperative farming agreements produced 356 acres of milo of which 104 acres were left standing in the field.

The 1966-67 wheat allotment of 600 acres included 440 acres under cooperative farming agreement and 160 acres farmed by refuge equipment and personnel. The winter drought and late killing frosts had serious effects on the wheat crop for the second year. The refuge planted wheat was not considered worth harvesting and some of the allotment was transferred to the Kirwin Refuge. The permittee wheat was rejuvenated by spring rains and most of it was harvested. The land cultivated by cooperative farming agreement is generally more sandy than that farmed by the refuge staff; it can be plowed and harvested when the refuge fields remain too muddy and sticky to work.



Early summer rains forestalled tillage of fields
for planting preparations and weed control. The
rank growth on this field had to be piled and
burned before plowing could be accomplished.
8/67 CRD

The 1967-68 wheat allotment remained the same; however one permittee failed to plant ninety-six acres.

The eight acres of Elbon rye north of Unit 5 produced a good crop but was not harvested since there was no wheat harvest. The mature grain was plowed under and fertilized for the production of an excellent volunteer stand which was extensively used by geese. The last of our rye seed was planted in farming unit A-5 but will be plowed under for green manure next spring.

A total of 28.7 acres of alfalfa were planted in Tracts 21a and 50 but the effort appeared to be a total loss.

C. Collections and Receipts.

Seed or other Propagules. Cooperatively farmed wheat returned 1,000 bushels of wheat to the refuge bins.

D. Control of Vegetation.

Mechanical control of vegetation consisted of mowing 300 acres of re-seeded grassland, dikes and canal banks to control weed growth and conserve moisture. All mowing was accomplished by refuge personnel using the Servis rotary mower and the Ferguson sickle bar mower. An estimated 140 acres of scattered Russian olive (Elaeagnus angustifolia), salt cedar (Tamarix gallica), and Fremont cottonwood (Populus fremontii) were hand sprayed with 2,4-D butyl ester at an approximate rate of .50 lb./acre. Early results appeared very good.

There appeared to have been a ninety-five per cent kill on the 150 acres of these species sprayed during 1966. There was no regrowth of salt cedar in Darrynane Lake where the trees were cut, the stumps treated and later flooded.

E. Planned Burning.

Tumbleweeds and Mexican firebush were burned from various canals and ditches to permit better flow. A dense pile of these weeds diverts water to the side of the ditches and causes erosion of the banks.

The prolific stand of sunflowers and other weeds in the wheat field of Tract 50 could not be mowed in early stages because of wet grounds. They were finally mowed in August, raked into piles and later burned.

F. Fires.

There were no fires on the refuge or adjacent land areas. Fire fighting equipment was maintained for readiness throughout the year. There was excellent vegetative growth after the summer rains and near drought conditions again by the end of the year.

IV. RESOURCES MANAGEMENT

A. Grazing.

Grazing units remained in good condition after the winter drought. Spring rains were sufficient to start vigorous growth early in the grazing season. Most of the pastures were in excellent condition at the end of the year.

Grazing units R-1, R-5 and R-17 in Tracts 80, 59 and 14 respectively, were returned to grazing use after several years of no grazing to replace pasture use lost from construction activities. The total grazing use was slightly greater than the previous year. One new permittee was added as a result of the acquisition of a large tract of land. Two former permittees were canceled because of construction activities and one grazed for only half the season because of pending construction. Sixteen permittees grazed 665 cattle on 5,220 acres for a total of 3,355 AUMs during the five month grazing season.

B. Haying.

Special use permits were issued to ten permittees who harvested 630.23 tons of native hay from 490 acres. The yield was slightly more than last year but not as good as expected after the summer rains. One of the permittees also harvested 16.5 tons of alfalfa hay, about half the amount of last year.

C. Other Uses.

Aspen Drilling Company continued their exploration north of the Big Salt Marsh in Sec. 28, T21S, R11W. Their third and fourth producing wells were completed late in the year. The last well was free flowing from the Lansing formation at 3,120 ft. with some gas being popped-off. It was also pumping from the Simpson formation at 3,359 ft.

The three dual producers developed by Raymond Oil Company a half-mile north of this area have all been reduced to single wells as the lower formation was producing too much salt water. Raymond Oil Company abandoned an oil well in NE $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 32, T21S, R11W.

Refuge receipts during the year are tabulated below.

Grazing, 3,355 AUMs @ \$2.25	\$7,548.75
Hay, native - 630.23 tons @ \$1.50	970.40
Hay, alfalfa - 16.5 tons @ \$3.00	49.50
Sale of surplus farm buildings	122.00
Sale of salvaged jeep	107.37
Dividend, Zenith Cooperative Grain Co.	29.19
Seismograph Exploration - 10 shot holes @ \$10.	100.00
Total	8,927.21



One of four information signs constructed
by Treasure Lake JC. The letters are
reflectorized. 11/67 JMC

V. FIELD INVESTIGATION OR APPLIED RESEARCH

A. Progress report.

Personnel and time were not available to continue work on the refuge herbarium.

VI. PUBLIC RELATIONS

A. Recreational Use.

Hunting was the only recreational use of the refuge available to the general public this year. Information on this activity is presented under sub-heading D. Hunting.

Fishing will be permitted on Unit 5 this next summer. An access road along the dike was surfaced with gravel and plans were begun for a barrier fence around the water control structures.

The Quivira Field Trial Club, Inc. held field trials on the refuge on March 18 - 19. We accumulated 150 visitor use-days from this activity. Fifteen owners entered twenty-seven dogs in the trials.

The Jayhawk Retriever Club of Wichita, Kansas held an American Kennel Club licensed retriever trial on the refuge March 24 - 26 with approximately 100 dogs entered. Visitor use-days amounted to 500. High winds and dry cover made fire danger extreme. No smoking was allowed and fire vehicles were manned for the duration of the trials. Precautions appear to have been adequate as no fires were started.

On October 29 the annual Duggan-Hamilton trail ride passed through the refuge with 116 horses and riders taking part. The participants enjoyed the ride in spite of the cold, wet weather.

B. Refuge Visitors.

<u>Date</u>	<u>Name</u>	<u>Organization</u>	<u>Purpose</u>
02/03/67	Glenn Hurst	KFFG, Pratt	Courtesy
	Paul Lies	"	"
02/14/67	E. Kirk Baker	Ext. Economist, Kansas Area Development, KSU	Cons. Dev.
02/14/67	Rollin Hornbuckle	Div. of Realty, R.O.	Land Appraisals
3/27-28/67	Ray Brown	State SCS Supvr.	Range Survey
	Dale Smith	SCS, St. John, Ks.	"
05/04/67	E. Kirk Baker	KSU	Cons. Dev.
06/5-6/67	Charles A. Hughlett	Chief, Br. of Operations, Div. of W/L Refuges, C.O.	Refuge
"	Lynn A. Greenwalt	Asst. Regional Supvr., Div. of W/L Refuges, R.O.	Inspection
06/07/67	Bert Blair	Asst. Mgr. Flint Hills NWR	Excess Property
07/06/67	Dean Deutsch	KFFG, Pratt	Courtesy
08/22/67	John J. Spence	Dist. Supvr., KFFG	Courtesy
08/29/67	Marvin E. Graasch	Lawrence, Kansas	Research



Mohawk District Boy Scout Camporee.
Refuge Personnel gave a demonstration of
firing a cannon net before 470 scouts
and advisors. 3/67 MBB

<u>Date</u>	<u>Name</u>	<u>Organization</u>	<u>Purpose</u>
08/29/67	Rick Jamison	Lawrence, Kansas	Research
10/14/67	George Moore	Director, KFFG	Refuge Visit
	Dr. Ira Gabrielson	W/L Mgt. Institute	"
10/23/67	Max Moxley	Editor, "The Bulletin", Sterling, Kansas	News Release
11/01/67	Ray Brown	State SCS Supervisor	Range Survey
	Dale Gillispie	SCS, St. John, Kansas	"
11/28/67	Merle Bennett	Refuge Manager, Kirwin	NWR Pick up grass drill
11/27/67	Howard Johnson	Mallard Express	Wheat Pickup

C. Refuge Participation.

The following is a tabulation of refuge participation for 1967. The participants are noted by initials as follows: Charles R. Darling - CRD; Michael B. Brownlee - MBB; Wayne E. Dale - WED.

<u>Date.</u>	<u>Organization</u>	<u>Number Present</u>	<u>Type of Program</u>	<u>Participant</u>
2/28	First Baptist Church of Ellinwood, Men's Club	18	Talk	CRD
3/2	Methodist Men's Club of Macksville	8	Talk	CRD
3/4	St. Marys of the Plains College, Ornithology Class	19	Refuge Tour	CRD
3/15	Stafford Methodist Adult Sunday School Class	30	Film Presentation	WED
4/15	Hesston College Ornithology Class	4	Refuge Tour	CRD
4/19	Circle K Club, Hutchinson Jr. Community College	22	Talk	CRD
4/22	Sylvia High School	50	Film	CRD
4/22	Sylvia Civic Club	25	Film	CRD
4/29	Mohawk Dist. Boy Scout Camporee, Haven, Ks.	470	Demonstration & Talk	CRD, MBB, WED
5/10	Stafford High School Biology Class	40	Refuge Tour	CRD
5/18	Cheyenne Bottoms Sportsman's Club	34	Talk	CRD
5/19	St. John Grade School	97	Refuge Tour	CRD, WED
5/20	Raymond Grade School	58	Refuge Tour	CRD, WED
5/25	Sylvia, Ks. Kindergarten	26	Refuge Tour	CRD
6/10	Emporia High School Biology Class	23	Refuge Tour	CRD
10/5	Stafford Lions Club	32	Film	CRD
10/5	Stafford High School FFA	60	Talk	CRD
10/10	Stafford Rotary Club	20	Talk	CRD



One of many information signs constructed
by the refuge staff to aid hunters.
10/67 JMC



Dispenser for refuge hunting maps made
of two inch redwood to resist weathering
and vandalism.. Operates similar to a
folded paper towel dispenser. 10/67 JMC

<u>Date</u>	<u>Organization</u>	<u>Number Present</u>	<u>Type of Program</u>	<u>Participant</u>
10/21	Senior Citizen's Club of Sterling	12	Slide Talk	CRD
10/25	Stafford High School Key Club	50	Film	CRD
11/7	Sylvia Civic Club	10	Slide Talk	CRD
11/13	Sylvia Township Meeting	13	Film	CRD
11/13	Sylvia High School Students	40	Film	CRD

D. Hunting.

The refuge Hunting and Fishing Plan was prepared and approved during the year. Approval was not received in time to permit fishing during the year or opening the hunting areas for the beginning of the goose season September 30. Five hunting areas, totaling 6,350 acres, were posted, parking areas established and press releases made for the grand opening in time for the first part of the split duck season beginning October 21.

This was one of the best duck years experienced in this section of Kansas in several years. Small water areas were plentiful, duck were abundant and fair weather prevailed through most of November. The anticipated rush of hunters to the refuge did not materialize. Saturday morning continued to be the heaviest use period and tapered to almost nothing during mid-week. Goose hunting was virtually confined to the first half-hour after sunrise as the birds flew from the roosting area to feeding areas.

Waterfowl hunters were pleased with the areas and the quality of the duck hunting. Most of the hunters relied upon the available cover without the use of decoys, duck calls or camouflage clothing. Although mallards were predominant throughout the season, they were not intensively bagged.

The opening day of pheasant season, November 11, was the greatest use day when an estimated 408 hunters made some attempt to pursue wild game. The dense cover of unused grasslands made upland game hunting very difficult and possibly reduced some of the enthusiasm for the opening of the quail season the following weekend.

Hunters were predominantly from Stafford and surrounding counties; however there were some who made trips from the eastern part of the state and a few from other states. Many expressed their pleasure that the refuge was providing public hunting areas and marveled at the size and quality of the areas.

E. Violations.

The number of violations during the hunting season was pleasingly low. The State Game Protectors worked closely with us both on

apprehensions and providing information to the hunters. The majority of the state cases resulted from short plugs while ours usually involved some form of trespass. In spite of the fact that care had been taken to properly post the area over and above the legal requirement and provide maps, some hunters were apprehended in closed areas. Some of these had not read the map properly while others had not looked at it at all. The latter usually had "heard that the refuge was open for hunting" and not bothered to look for a map. It is hoped that hunters will better inform themselves next year.

Violations are listed below. Those with no court costs indicated were the result of cases tried in the Commissioners court in Hutchinson, Kansas while those with costs indicated were tried by the state Probate Judge in St. John, Kansas. Initials of officials are as follows: Charles Darling - CD; Jim Carroll - JC; Earl Miller - EM; GMA Jim Robinson - JR; State Game Protector Dean Deutsch - DD.

<u>Date</u>	<u>Violator</u>	<u>Violation</u>	<u>Fine/Court Cost</u>	<u>Officer</u>
10/8	Gerald Dunnegan, Wichita	Short Plug	10/9	DD
10/21	Loyd Simpson, Hutchinson	Short Plug	10/9*	DD
10/22	Don Weingarten, Hutchinson	Short Plug	10/9	DD
10/25	J. D. Penny, Gt. Bend	Trespass	15/0	EM
10/25	R. E. Smith, Pawnee Rock	Trespass	15/0	EM
10/25	J. R. Richard, Gt. Bend	Trespass	15/0	EM
10/25	Tom Wright, Gt. Bend	Trespass	15/0	EM
10/28	Leo Holmes, Pratt	Short Plug	10/9*	DD
11/4	G. B. Wines, Gt. Bend	Hunting in Closed Area	25/0	EM
11/4	V. L. Lindholm, Gt. Bend	Hunting in Closed Area	25/0	EM
11/5	J. R. Heller, Cimmaron	Late Shooting	25/0	JR
		Overbag of Ducks	100/0	JR
11/5	T. N. Mead, Cimmaron	Late Shooting and overbag of ducks	/20	JR
	(Mead, a juvenile, adjudged a miscreant by the court; in addition to costs, probation 30 days, and to write a theme on hunting laws.)			
11/11	S. G. Kimple, Ellinwood	Hunting upland game w/o stamp	5/9	JC
11/11	D. F. Wishon, Hutchinson	Poss. Pheasant in a Closed Area	25/0	CD
11/16	J. E. Holt, Jacksonville, Arkansas	Hunting in a Closed Area	25/0	CD
12/9	Michael Mock, Hutchinson	Late Shooting	10/6.36	JR
12/9	Donald Mock, Hutchinson	Late Shooting	/15	JR
	(Mock, a juvenile, also on 90 days parol to juvenile officer, and to write theme on waterfowl)			
12/9	Ronald Simmons, Hutchinson	Late Shooting	10/6.36	JR
12/10	K. D. Holmes, Wichita	Late Shooting	25/0	CD
12/10	S. E. Holmes, Wichita	Late Shooting	25/0	CD

<u>Date</u>	<u>Violator</u>	<u>Violation</u>	<u>Fine/Court Cost</u>	<u>Officer</u>
12/16	Billy Hedger, Hutchinson	Hunting in Closed Area	25/0	JR
12/16	Vincent Osborne, Nickerson	Hunting in Closed Area	25/0	JR
12/16	Preston Smith, Hutchinson	Hunting in Closed Area	25/0	JR
12/17	Frank Holt, Wichita	Hunting in Closed Area	25/0	JC
12/17	R. M. Wulz, Wichita	Hunting in Closed Area	25/0	JC
12/17	H. L. Kelly, Wichita	Hunting in Closed Area	25/0	JC
12/30	Charlie Pounds, Wichita	Hunting in Closed Area	25/0	JC
12/30	A. O Bush, Wichita	Hunting in Closed Area	25/0	JC
12/30	L. C. Alexander, Wichita	Hunting in Closed Area	25/0	JC

* Hunting Liscence revoked for 30 days.

F. Safety.

Staff and safety meetings were held at irregular intervals with pre-dominant emphasis during the period of summer employment. Safety correspondence was discussed as well as on-the-premises problems that applied to the entire staff. Seasonal and general safety problems were presented when necessary with the appropriate persons in attendance. The overall purpose of these meetings was to eliminate hazards and maintain safety consciousness. Safety precautions included checking fire extinguishers, marking water control structures and objects hidden in undergrowth with red metal fence posts, construction of a stile where a hunter access path crossed a fence and construction of railings along water control structures used as bridges into hunting units. Special attention was given to possible hazards to the hunting public.

One injury required medical attention to assure that there was no serious damage. Refuge employees attained a safety record of 920 days without a lost time accident.

VII. OTHER ITEMS

A. Items of Interest.

Tract 15, W $\frac{1}{2}$ Sec. 24, T21S, R11W., was purchased in November although we did not obtain possession before the end of the year. Three tracts totaling 640 acres, under two ownerships, remain to be acquired.

Maintenanceman Darrell Keesling transfered to the Bear River Refuge in April to assume duties as mechanic-pilot.

Louis Wilson received a career-conditional appointment as maintenance-man in mid-June after being employed several months as Laborer, Farm. Louie took a day off for personal business shortly after Christmas and suffered a mild heart attack. He is expected to return to full duty status in the near future.

Assistant Manager Michael Brownlee transferred with a promotion to the Horicon NWR in mid-June. He was replaced by James M. Carroll, Jr. from the Tishomingo NWR in August. Jim, his wife and two children, are living at refuge headquarters.

The bulk of this report was written by Assistant Manager Carroll. Refuge Clerk Wayne Dale prepared the NR forms and typed the report.

B. Photographs.

A few appropriate photographs are mingled within the text of this report.

Respectfully Submitted

Charles R. Darling

Charles R. Darling, Refuge Manager

February 7, 1968


Reviewed By: _____

Date: _____

Reviewed By: 
Assistant Regional Director-Operations

Date: FEB 21 1968

3-1750
Form NR-1
(Rev. March 1953)

W A T E R F O W L

REFUGE Quivira Nat'l. W/L Refuge

MONTHS OF January TO April, 1967

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
	:	:	:	:	:	:	:	:	:	:
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	1850	2250	2800	3530	3587	3925	3968	4448	4098	3965
Cackling										
Brant										
White-fronted	4					483	630	1361	1883	1825
Snow										
Blue	1							1		
Other										
Ducks:										
Mallard	11100	17500	36000	34115	30534	50550	53469	54025	23609	23250
Black										
Gadwall										
Baldpate										
Pintail	150			5	693	1950	1450	5678	19595	30000
Green-winged teal				6						
Blue-winged teal										
Cinnamon teal										
Shoveler										
Wood										
Redhead										
Ring-necked							13	53	100	
Canvasback								18	159	
Scaup										
Goldeneye				2			13	26		
Bufflehead	10	65	25	7			12	23	39	50
Ruddy										
Other Comm. Merg.		30	60	1371	266	342	190	227	136	50

3-1750a
 Cont. NR-1
 (Rev. March 1953)

WATERFOWL
 (Continuation Sheet)

REFUGE Quivira Nat'l. W/L Refuge

MONTHS OF January TO April, 1967

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods Estimated seen total	
	11	12	13	14	15	16	17	18			
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada	935	1300	35	60	35				257,502		
Cackling											
Brant											
White-fronted	50	500							147,152		
Snow		20							110		
Blue		5							19		
Other											
Ducks:											
Mallard	16325	5170	601	5615	285	210	125		2,539,691		
Black											
Gadwall	15	105	20	5	15	15	20		1,785		
Baldpate	205	37	2	505	67	12	6		6,018		
Pintail	20300	7615	505	1820	130	50	6		650,839		
Green-winged teal	210	755	260	170	15	105			10,857		
Blue-winged teal		2	655	550	517	1922	2615		111,037		
Cinnamon teal											
Shoveler	10	135	1060	1180	815	1208	1180		113,626		
Wood											
Redhead	700	1175							16,387		
Ring-necked	120	190	115	110	125		11		9,597		
Canvasback	26	22	11						113		
Scaup	175	25	130	110	265	205	166		9,812		
Goldeneye	13								378		
Bufflehead	325	1110	178	55	110	60			9,793		
Ruddy		327	35	87	275	172	50		6,622		
Other Comm. Merg.	65	22							19,313		
Coot:	110	355	160	305	350	590	610		19,670		
					(over)						

	Total Days Use	Peak Number	Total Production	SUMMARY
Swans				Principal feeding areas <u>Green wheat and rye fields,</u>
Geese	<u>304,843</u>	<u>5,981</u>		<u>milo fields, both on and off the refuge.</u>
Ducks	<u>3,369,228</u>	<u>60,050</u>		Principal nesting areas _____
Coots	<u>19,670</u>	<u>640</u>		

Reported by _____

Charles R. Darling, Refuge Manager

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

- (1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.
- (2) Weeks of Reporting Period: Estimated average refuge populations.
- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
- (4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

(over)

3-1750
Form NR-1
(Rev. March 1953)

W A T E R F O W L

REFUGE Quivira Nat'l. W/L Refuge, Stafford, Kansas

MONTHS OF May TO August, 1967

(1) Species	(2) Weeks of reporting period									
	: 5/1-6	: 5/7-13	: 5/14-20	: 5/21-27	: 5/28-6/3	: 6/4-10	: 6/11-17	: 6/18-24	: 6/25-7/1	: 7/2-8
	: 1	: 2	: 3	: 4	: 5	: 6	: 7	: 8	: 9	: 10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada										
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	425	350	350	350	350	330	200	200	150	120
Black										
Gadwall	20	20	20	20	20	20	20	20	20	20
Baldpate	6	5	5	5	5	2	2	2	2	2
Pintail	6									
Green-winged teal										
Blue-winged teal	2600	1500	1500	1200	800	220	220	220	220	220
Cinnamon teal										
Shoveler	1180	1000	600	150	150	80				
Wood							2			
Redhead										
Ring-necked	4									
Canvasback										
Scaup	160	120	80	70	70	70	20	20	20	20
Goldeneye										
Bufflehead										
Ruddy	50									
Other										
Coot	640	500	300	300	300	210	50	50	50	30

3-1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Quivira Nat'l. W/L Refuge, Stafford, Kansas MONTHS OF May TO August, 19 67

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods: seen Estimate: total
	7/9-15 11	7/16-22 12	7/23-29 13	7/30-8/5 14	8/6-12 15	8/13-19 16	8/20-26 17	8/27-31 18		
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada										
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	100	100	120	120	110	150	150	350	27,050	3 50
Black										
Gadwall	20	20	20	30	30	30	30	30	2,790	2 15
Baldpate	2	2	2	2	2	2	2	2	351	
Pintail					3			600	3,057	
Green-winged teal										
Blue-winged teal	220	220	210	210	210	250	300	375	72,115	10 120
Cinnamon teal										
Shoveler									22,710	
Wood									11	
Redhead										
Ring-necked								1	29	
Canvasback					1				7	
Scaup	20	20	20	20	20	20	25	25	5,530	1 6
Goldeneye										
Bufflehead										
Ruddy										
Other										
Coot:	20	20	20	20	20	20	20	20	17,450	
				(over)						

	(5)	(6)	(7)	SUMMARY
	Total Days Use	Peak Number	Total Production	
Swans	:	:	:	Principal feeding areas <u>Flooded Units and marsh meadows</u>
Geese	:	:	:	
Ducks	134,002	4,751	191	Principal nesting areas <u>Units 5,7,11a,11b,20a,20b.</u>
Coots	17,450	640	:	

Reported by Charles R. Darling, Refuge Manager

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

- (1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.
- (2) Weeks of Reporting period: Estimated average refuge populations.
- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
- (4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

3-1750
Form NR-1
(Rev. March 1953)

W A T E R F O W L

REFUGE Quivira National Wildlife Refuge

MONTHS OF September TO December, 1967

(1) Species	(2) Weeks of reporting period									
	9/3-9 1	9/10-16 2	9/17-23 3	9/24-30 4	10/1-7 5	10/8-14 6	10/15-21 7	10/22-28 8	10/29-11/4 9	11/5-11 10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada				11	235	395	1330	2990	1900	2780
Cackling										
Brant										
White-fronted					80	80	80			
Snow							4	8	10	1
Blue										
Other										
Ducks:										
Mallard	340	690	2548	5155	2605	812	5810	6285	8610	18405
Black										
Gadwall		150		600		685	1360	1750	700	750
Baldpate		430	800	2370	1915	695	1830	1380	1200	140
Pintail	24	698	490	1350	1410	795	1000	830	950	1260
Green-winged teal	200	500			40	1168	945	1680	1605	670
Blue-winged teal	1100	1176	1795	835	1055	1245	705	350		
Cinnamon teal		7								
Shoveler		150	35	9	430	591	95	100	80	300
Wood		1			2					
Redhead		1				70		450	275	72
Ring-necked		50						150	50	
Canvasback		150	1					10	25	3
Scaup		150	93	245		100	80	6		20
Goldeneye							80			1
Bufflehead									40	
Ruddy			1				65	20	60	80
Other										
Coot		6	75	1310	1875	1495	3185	1450	1695	960

3-1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Quivira National Wildlife Refuge

MONTHS OF September TO December, 19 67

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods:Estimat seen : total
	11/12-18: 11	11/19-25: 12	11/26-12/2: 13	12/3-9: 14	12/10-16: 15	12/17-23: 16	12/24-30: 17	18		
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	3150	4200	4400	4808	3415	1650	6637		265,307	
Cackling										
Brant										
White-fronted									1,680	
Snow	7	6	2	4	4	2	1		343	
Blue	1	1							28	
Other										
Ducks:										
Mallard	24500	42450	52956	43742	48822	50502	81		2,200,191	
Black										
Gadwall	20			308	105				45,016	
Baldpate	30	255	55	476	222	35			82,831	
Pintail	930	600	108	2131	12	375	19		90,874	
Green-winged teal	675	310	265	6919	11100	645			190,544	
Blue-winged teal									57,827	
Cinnamon teal									49	
Shoveler	80		23	735	1670	35			30,331	
Wood									21	
Redhead	70	80	95	182	35				9,310	
Ring-necked	15	15	65	75	75				3,465	
Canvasback	2	8	34	10	61				2,128	
Scaup	280	60	48	25	790	21			13,426	
Goldeneye			90			45			1,512	
Bufflehead	40	80	150	23	31	20			2,688	
Ruddy	30	60	50	12	25	6			2,863	
Other Comm. Merg.			41	61	25	220	42		2,723	
Coot:	235	150	75	4					87,605	
				(over)						

WATERFOWL
(Continuation Sheet)

	(5)	(6)	(7)	SUMMARY
	Total Days Use	: Peak Number	: Total Production	
Swans		:	:	Principal feeding areas Milo and wheat fields both on and
Geese	267,358	: 6,638	:	off the refuge.
Ducks	2,735,799	: 62,973	:	Principal nesting areas
Coots	87,605	: 3,185	:	
				Reported by
				Charles R. Darling, Refuge Manager

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

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- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
- (4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

(Aug. 1952)

(Other than Waterfowl)

Refuge Quivira Nat'l. W/L Refuge Months of January 000 to April 8, 1967

(1) Species		(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Inclusive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Use	
I. Water and Marsh Birds:											
Pied-billed Grebe	2	3/17	10	4/12	Present					250	
Eared Grebe	11	3/21	50	4/12	Present					1800	
White Pelican	175	4/5	600	4/19	10	4/23				5800	
D/C Cormorant	10	3/21	179	3/30	Present					3000	
Great Blue Heron	2	3/30	20	4/5	Present					400	
B-C Night Heron	1	4/27	1	4/27	Present					10	
Green Heron	1	4/23	1	4/23	Present					15	
Wilson's Phalarope	160	4/27	160	4/27	Present					1000	
Common Egret	1	4/15		Only the one record.						15	
II. Shorebirds, Gulls and Terns:											
Sandhill Crane	41	3/2	2134	3/21	6	4/5				16600	
Greater Yellowlegs	2	3/17	100	4/30	Present					2500	
Lesser Yellowlegs	15	3/21	65	4/27	Present					1400	
American Avocet	80	4/17	100	4/20	Present					1500	
Ring-billed Gull	12	2/2	35	3/30	15	4/12				1000	
Herring Gull	1	3/13	3	3/21	3	3/21				60	
Franklin's Gull	1	3/24	1500	4/27	Present					25000	
Killdeer	1	3/11	350	4/5	Present					10500	
White-rumped S-Piper	2	3/24	50	4/5	Present					1500	
Baird's Sandpiper	10	3/17	200	4/19	Present					6500	
Semi-palmated S-P	60	4/19	250	4/27	Present					6500	
Least Sandpiper	15	3/21	215	4/30	Present					3000	
Common Snipe	5	4/12	50	4/30	Present					750	
Snowy Plover	1	4/15	25	4/12	Present					500	
Forster's Tern	1	4/19	10	4/27	Present					60	
Least Tern	1	4/27	1	4/27	Present					10	
(over)											

(1)	(2)		(3)	(4)		(5)	(6)
III. Doves and Pigeons:							
Mourning dove	2	3/19	600	4/30	Present		10000
White-winged dove							
IV. Predaceous Birds:							
Golden eagle	Present		6	1/17	1	3/15	250
Duck hawk							
Horned owl	Resident		10		Present		1200
Magpie							
Raven Turkey Vulture	1	4/17	1	4/17	Present		15
Crow	Resident		50		Present		6000
Bald Eagle	Present		17	1/17	1	3/30	750
Swainson's Hawk	3	3/30	35	4/12	Present		4500
Marsh Hawk	Present		75	1/18	10	4/12	1500
Rough-legged Hawk	Present		25	1/11	1	3/8	150
Ferruginous Hawk	Present		2	2/15	2	2/15	60
Prairie Falcon	Present		1	1/18	1	2/16	60
Sparrow Hawk	Present		50	3/30	Present		2000
Red-tailed Hawk	Present		4	3/1	4	3/1	260
Burrowing Owl	Present		75	4/30	Present		4000
Short-eared Owl	1	1/30	Only one record		Reported by		

INSTRUCTIONS

(See Sec. 7532, Charles B. Darling, Refuge Manager, Wildlife Refuges, Field Manual)

(1) Species:

Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)

II. Shorebirds, Gulls and Terns (Charadriiformes)

III. Doves and Pigeons (Columbiformes)

IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen:

The first migration record for the species for the reporting period.

(3) Peak Numbers:

Estimated number and inclusive dates when peak population of the species occurred.

(4) Last Seen:

The last refuge record for the species during the season concerned.

(5) Production:

Estimated number of young produced based on observations and actual counts.

(6) Total:

Estimated species days use (average population X no. days present) of refuge during the reporting period.

3-1751

Form NR-1A

(Aug. 1952)

MIGRATORY BIRDS
(Other than Waterfowl)Refuge Quivira NWRMonths of May to August, 19 67

(1) Species		(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Production			(6) Total
Common Name		Number	Date	Number	Inclusive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Use
I. <u>Water and Marsh Birds:</u>											
Eared Grebe		Present		50	April	3	5/25				1500
Pied-billed Grebe		Present		80	July-Aug.	30	8/31			50	5700
Double-crested Cormorant		Present		10	May	3	8/31				600
Great Blue Heron		Present		50	Period	Present	8/31				6000
Green Heron		Present		40	August	Present	8/31			20	4200
B/C Night Heron		Present		15	June	2	July				500
American Bittern	1	5/5		6	Early June	1	Mid-June				30
II. <u>Shorebirds, Gulls and Terns:</u>											
Snowy Plover		Present		40	Mid-June	5	6/20				1800
Killdeer		Present		80	Mid-June	30	8/31			50	5500
Black-bellied Plover	4	5/8			Only the one record						4
Long-billed Curlew	2	5/8			Only the one record						2
Upland Plover	1	5/8			Only the one record						1
Spotted Sandpiper	1	5/10		10	July	4	8/31				500
Solitary Sandpiper	1	5/4			Only the one record						1
Greater Yellowlegs		Present		100	Early May	Present	8/31				3200
Lesser Yellowlegs		Present		50	Early May	Present	8/31				1600
American Avocet		Present		50	Early May	1	8/10				1150
Wilson's Phalarope		Present		150	Early May	3	8/10				2600
Franklin's Gull		Present		1500	Early May	50	8/31				35000
Forster's Tern		Present		10	Early May	5	5/25				200
Black Tern	8	5/10		30	June	18	8/10				2400
Semipalmated Plover	1	5/8			Only the one record						1
Willet	8	5/8			Only the one record						8
Least Sandpiper		Present		200	Early May	10	5/25				4500
						(over)					

(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons:					
Mourning dove	Present	3,000	July-Aug.	Present	1800
White-winged dove					255,000
IV. Predaceous Birds:					
Golden eagle					
Duck hawk					
Horned owl	Resident	15			1800
Magpie					
Raven					
Crow	Resident	50			3600
Swainson's Hawk	Present	35	August	Present	2400
Turkey Vulture	Present	3	Early June	1	100
Mississippi Kite	1 5/8	12	June-July	Present	950
Burrowing Owl	Present	120	July-Aug.	Present	60 7600
Reported by					

INSTRUCTIONS (See Sec. 7532, Wildlife Refuge Field Manual)

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
 II. Shorebirds, Gulls and Terns (Charadriiformes)
 III. Doves and Pigeons (Columbiformes)
 IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated species days use (average population X no. days present) of refuge during the reporting period.

(Aug. 1952)

(Other than Waterfowl)

to December

1967

(1) Species	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Production		(6) Total	
Common Name	Number	Date	Number	Inclusive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Use
I. Water and Marsh Birds:										
Western Grebe			1	10/31 (only sighting)						7
Pied-billed Grebe	30	present	45	9/20-10/25	20	11/18				2,528
White Pelican	60	9/17	2450	9/28-10/13	2	11/25				57,753
D-C Cormorant	4	9/17	65	10/6	11	10/14				702
Great Blue Heron	38	present	75	9/12	1	11/25				3,268
Green Heron	40	present	40	9/1	3	10/14				1,232
B/C Night Heron	8	9/3	40	9/12	3	11/18				1,292
American Bittern	2	9/3	10	9/12	4	11/18				380
Whooping Crane			4	10/26 (only sighting)						
Sandhill Crane	6	10/1	281	10/19	60	11/25				6,496
II. Shorebirds, Gulls and Terns:										
Killdeer	30	present	350	9/28	40	11/18				11,060
Spotted Sandpiper			295	9/20 (only sighting)						2,065
Greater Yellowlegs	11	present	25	10/13	25	10/14				880
Lesser Yellowlegs	18	present	20	10/28	20	10/14				836
White-rumped S-Piper			4	9/28 (only sighting)						28
Baird's Sandpiper	2	9/3	90	10/13	90	10/14				2,460
Least Sandpiper	60	9/24	60	9/28	45	10/14				1,100
Dowitcher			8	10/6 (only sighting)						56
Semipalmated S-Piper	34	9/3	75	10/19	75	10/21				2,928
American Avocet	29	9/3	35	9/28	2	10/14				902
Ring-billed Gull	3	9/24	7000	10/13	42	12/23				140,880
Franklin's Gull	3000	10/1	3000	10/6	10	10/14				28,042
(over)										

(1)	(2)	(3)	(4)	(5)	(6)		
III. <u>Doves and Pigeons:</u>							
Mourning dove	3000	present	3000	9/1	12	12/27	236,472
White-winged dove							
IV. <u>Predaceous Birds:</u>							
Golden eagle	1	10/8	6	12/6	6	present	361
Duck hawk							
Horned owl	Resident		15			present	1,830
Magpie							
Raven							
Crow	100	present	5000	10/15	253	present	173,932
Mississippi Kite	12	present	12	9/1	12	9/2	24
Sharp-shinned Hawk	35	present	35	9/1	2	12/23	2,736
Red-tailed Hawk	10	9/24	10	9/28	1	present	686
Swainson's Hawk	8	present	20	10/6	2	12/23	1,140
Rough-legged Hawk	48	10/8	48	10/12	1	12/9	398
Bald Eagle	6	11/12	14	12/11	12	present	524
Marsh Hawk	125	present	150	10/28	41	present	12,810
Sparrow Hawk	30	10/1	30	10/6	7	present	2,024
Burrowing Owl	120	present	120	present	120	present	11,640
Short-eared Owl	5	12/24	5	12/29	5	present	25

INSTRUCTIONS (See Sec. 7532, Wildlife Refuges Field Manual)

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
 II. Shorebirds, Gulls and Terns (Charadriiformes)
 III. Doves and Pigeons (Columbiformes)
 IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated species days use (average population X no. days present) of refuge during the reporting period.

3-1750b

Form NR-1B

(Rev. Nov. 1957)

INSTRUCTIONS
UNITED STATES

DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Quivira NWRFor 12-month period ending August 31, 1967Reported by Charles R. Darling

Title

Refuge Manager

(1) Area or Unit Designation	(2) Habitat Type Acreage	(3) Use-days	(4) Breeding Population	(5) Production
A.	Crops	260	Ducks	3,531,825
	Upland	1220	Geese	359,616
	Marsh	140	Swans	
	Water	640	Coots	33,239
	Total	2560	Total	3,927,710
			50	51
B.	Crops	23	Ducks	73,535
	Upland	822	Geese	35
	Marsh	90	Swans	
	Water	25	Coots	1,230
	Total	960	Total	71,800
			10	10
C.	Crops	850	Ducks	1,866,336
	Upland	3810	Geese	50,932
	Marsh	80	Swans	
	Water	60	Coots	19,792
	Total	4800	Total	1,937,060
			90	100
D.	Crops	700	Ducks	222,917
	Upland	1840	Geese	39,970
	Marsh	20	Swans	
	Water		Coots	2,100
	Total	2560	Total	261,987
E.	Crops	410	Ducks	588,395
	Upland	3620	Geese	33,195
	Marsh	80	Swans	
	Water	50	Coots	5,232
	Total	4160	Total	627,122
F.	Crops		Ducks	671,651
	Upland	700	Geese	3,136
	Marsh	3940	Swans	
	Water	720	Coots	35,237
	Total	5360	Total	710,114
			30	30
G.	Crops	160	Ducks	2,554
	Upland	1380	Geese	
	Marsh	40	Swans	
	Water	20	Coots	
	Total	1600	Total	2,554

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

- (1) Area or Unit: A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.
- (2) Habitat: Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.
- (3) Use-days: Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.
- (4) Breeding Population: An estimate of the total breeding population of each category of birds for each area or unit.
- (5) Production: Estimated total number of young raised to flight age.

3-1750c
Form NR-1C
(Sept. 1960)

WATERFOWL HUNTER KILL SURVEY

Refuge Quivira National Wildlife Refuge

Year 1967

(1) Weeks of Hunting	(2) No. Hunters Checked	(3) Hunter Hours	(4) Waterfowl Species and Nos. of Each Bagged	(5) Total Bagged	(6) Crippling Loss	(7) Total Kill	(8) Est. No. of Hunters	(9) Est. Total Kill
10/21-27	46	133	C.Goose(21), Mallard(39), Gadwall(15), Widgeon(4), Pintail(16), G-W Teal(15), B-W Teal(13), Shoveller(14), Redhead(3), L. Scaup(2), Goldeneye(1), Ruddy(1)	144	3	147	115	368
10/28-11/3	37	107	C.Goose(7), Mallard(23), Gadwall(9), Widgeon(7), Pintail(14), G-W Teal(11), Shoveller(3), Redhead(3), Ring-necked(2), Canvasback(4), L. Scaup(2)	84	4	88	92	220
11/4-10	63	183	C.Goose(1), Mallard(15), Gadwall(4), Widgeon(5), Pintail(7), G-W Teal(8), Shoveller(5), Redhead(7), Ring-necked(3),	56	-	56	158	140
11/11-17	133	386	C.Goose(9), Mallard(33), Gadwall(11), Widgeon(5), Pintail(3), G-W Teal(8), Shoveller(3), Redhead(2)	64	1	65	333	162
11/18-24	94	273	C.Goose(4), Mallard(12), G-W Teal(1), Shoveller(2), Ruddy(2)	21	-	21	234	52
11/25-12/1	26	75	C.Goose(14)	14	5	19	65	47
12/2-8	49	142	C.Goose(2), Ruddy(1)	3	1	4	122	10
12/9-15	87	252	Mallard(11), Gadwall(4), Widgeon(1), Pintail(1), Shoveller(12), Canvasback(4), L.Scaup(18)	51	1	52	218	130
12/16-22	37	107	Widgeon(1), G.W. Teal(1)	2	-	2	93	5
12/23-29	17	49		-	-	-	42	0
12/30-31	4	12		-	-	-	11	0
Totals	593	1720		439	15	454	1483	1134

(over)

INSTRUCTIONS

- (1) The first week of hunting begins with opening day and ends at the close of hunting 6 days later. Successive weeks follow the same pattern.
- (2) The goal is to survey a minimum of 25 percent of refuge hunters each week and to record data only from those who have completed their day's hunting. This information should be collected during each day of the week and in each area hunted in relative proportion to the hunter effort expended. When the 25 percent goal cannot be achieved, particular care should be taken to collect representative data.
- (3) Record the total number of hours the hunters spent hunting on the refuge.
- (4) List waterfowl species in decreasing order of numbers bagged. Sample entry: Mallard (61), Pintail (36), Redhead (16), Gadwall (11), Widgeon (6), Coot (4), Canada Goose (3), Green-winged Teal (1).
- (5) Record total numbers of waterfowl bagged.
- (6) Record total numbers of waterfowl reported knocked down but not recovered.
- (7) Total of Columns 5 and 6.
- (8) Estimate the total number of hunters who hunted on the refuge during the week, including hunters checked (Column 2).
- (9) Kill sample projected to 100 percent. $\text{Column 9} = \frac{\text{Column 8}}{\text{Column 2}} \times \text{Column 7}.$

3-1750c
Form NR-1C
(Sept. 1960)

WATERFOWL HUNTER KILL SURVEY

NR-1C

Refuge Quivira National Wildlife Refuge

Year 196 7

(1) Weeks of Hunting	(2) No. Hunters Checked	(3) Hunter Hours	(4) Waterfowl Species and Nos. of Each Bagged	(5) Total Bagged	(6) Crippling Loss	(7) Total Kill	(8) Est. No. of Hunters	(9) Est. Total Kill
			SUMMARY					
			Mallard	133				
			Canada Goose	59				
			Green-winged Teal	44				
			Pintail	41				
			Shoveller	39				
			Gadwall	32				
			Widgeon	23				
			L. Scaup	22				
			Redhead	15				
			Blue-winged Teal	13				
			Canvasback	8				
			Ring-necked	5				
			Ruddy	4				
			Goldeneye	1				
			Total	439				

(over)

Year 1961

Refuge: _____

INSTRUCTIONS

- (1) The first week of hunting begins with opening day and ends at the close of hunting 6 days later. Successive weeks follow the same pattern.
- (2) The goal is to survey a minimum of 25 percent of refuge hunters each week and to record data only from those who have completed their day's hunting. This information should be collected during each day of the week and in each area hunted in relative proportion to the hunter effort expended. When the 25 percent goal cannot be achieved, particular care should be taken to collect representative data.
- (3) Record the total number of hours the hunters spent hunting on the refuge.
- (4) List waterfowl species in decreasing order of numbers bagged. Sample entry: Mallard (61), Pintail (36), Redhead (16), Gadwall (11), Widgeon (6), Coot (4), Canada Goose (3), Green-winged Teal (1).
- (5) Record total numbers of waterfowl bagged.
- (6) Record total numbers of waterfowl reported knocked down but not recovered.
- (7) Total of Columns 5 and 6.
- (8) Estimate the total number of hunters who hunted on the refuge during the week, including hunters checked (Column 2).
- (9) Kill sample projected to 100 percent. $\text{Column 9} = \frac{\text{Column 8}}{\text{Column 2}} \times \text{Column 7}.$

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Quivira Nat'l. W/L Refuge

Months of January to April, 1967

(1) Species	(2) Density	(3) Young Produced	(4) Sex Ratio	(5) Removals	(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'd. Estimated Total	Percentage	Hunting For Re- stocking For Research	Estimated number using Refuge Pertinent infor- mation not specific- ally requested. List introductions here.
Ring-necked Pheasant	Marshes, brush, shelterbelts, fence rows, wild plum thickets, willow thickets, tall- grass prairie lands	10.6		50-50		1,500
Bobwhite	-do-	8.0		50-50		2,000

* Only columns applicable to the period covered should be used.

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

- | | |
|---------------------|--|
| (1) SPECIES: | Use correct common name. |
| (2) DENSITY: | Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks. |
| (3) YOUNG PRODUCED: | Estimated number of young produced, based upon observations and actual counts in representative breeding habitat. |
| (4) SEX RATIO: | This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available. |
| (5) REMOVALS: | Indicate total number in each category removed during the report period. |
| (6) TOTAL: | Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons. |
| (7) REMARKS: | Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested. |

* Only columns applicable to the period covered should be used.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Quivira Nat'l. W/L Refuge Months of May to August, 1967

(1) Species	(2) Density	(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs.'v'd. Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasant	Marshes, brush, shelterbelts, fence rows, wild plum thickets, willow thickets, tall prairie grasses	7.0	18	1400	50-50			2,900	
Bobwhite	"" ""	4.4	30	2000	50-50			4,000	

* Only columns applicable to the period covered should be used.

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

- | (1) SPECIES: | Use correct common name. | (4) Sex | (3) Young | (2) Density | (1) Species |
|---------------------|--|---------|-----------|-------------|-------------|
| (2) DENSITY: | Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks. | | | | |
| (3) YOUNG PRODUCED: | Estimated number of young produced, based upon observations and actual counts in representative breeding habitat. | | | | |
| (4) SEX RATIO: | This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available. | | | | |
| (5) REMOVALS: | Indicate total number in each category removed during the report period. | | | | |
| (6) TOTAL: | Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons. | | | | |
| (7) REMARKS: | Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested. | | | | |

* Only columns applicable to the period covered should be used.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Quivira Nat'l. W/L Refuge Months of September to December, 1967

(1) Species	(2) Density	(3) Young Produced	(4) Sex Ratio	(5) Removals	(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'd. Estimated Total	Hunting For Re- stocking For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasant	Marshes, brush, shelterbelts, fence rows, wild plum thickets, tall prairie grasses.	7.3	50-50	34 0 0	3,000	Hunting removals are those actually counted in the hunter bag.
Bobwhite	" " "	4.9	50-50	159 0 0	4,250	" " "

* Only columns applicable to the period covered should be used.

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

- | (1) SPECIES: | Use correct common name. | (4) Sex | (3) Young | (2) Density | (1) Species |
|---------------------|--|---------|-----------|-------------|-------------|
| (2) DENSITY: | Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks. | | | | |
| (3) YOUNG PRODUCED: | Estimated number of young produced, based upon observations and actual counts in representative breeding habitat. | | | | |
| (4) SEX RATIO: | This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available. | | | | |
| (5) REMOVALS: | Indicate total number in each category removed during the report period. | | | | |
| (6) TOTAL: | Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons. | | | | |
| (7) REMARKS: | Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested. | | | | |

* Only columns applicable to the period covered should be used.

3-1753
Form NR-3
(June 1945)

BIG GAME

Refuge Quivira Nat'l. W/L Refuge Calendar Year 1967

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions	(7) Estimated Total Refuge Population		(8) Sex Ratio	
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re- stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
White-tailed Deer	Shelterbelts, tall prairie grasses, timber claims and salt cedar thickets	25	0	0	0	0				0		80	80	1:1

Remarks:

Reported by _____

INSTRUCTIONS

Form NR-3 - BIG GAME

- (1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.
- (2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated total number of young produced on refuge.
- (4) REMOVALS: Indicate total number in each category removed during the year.
- (5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.
- (6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.
- (7) TOTAL REFUGE POPULATION: Give the estimated population of each species on the refuge at period of its greatest abundance and also as of Dec. 31.
- (8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

116008

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Quiyira Nat'l. W/L Refuge

Year ending April 30, 1967

(1) Species	(2) Density	(3) Removals					(4) Disposition of Furs					(5) Total		
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re- stocking	For Re- search	Share Trapping			Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	Popula- tion
								Permit Number	Trappers Share	Refuge share				
Opossum	Upland woods and range, 15,000 a.	100												150
Raccoon	22,000 a.	175												125
Mink	Streams and marshes, 10,000 a.	500												20
Skunk	22,000 a.	100												250
Badger	Upland sand hills 6,000 a.	120												50
Coyote	22,000 a.	440												50
Blacktail prairie dog	100 a.	.08												1250
Fox squirrel	Shelter Belts, 100a.	1												100
Beaver	Rattlesnake Creek, Horseshoe Lake	1.5												35
Blacktail Jackrabbit	Upland range and Shelterbelts, 16,000a.	320												50
Cottontail	-do-	4												4000
Muskrat	Ponds, 500 a.	12												40
Weasel	Streams & Marshes, 6,000 a.	400												15

* List removals by Predator Animal Hunter

* List removals by Predator Animal Hunter

REMARKS:

Reported by

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

- | (1) SPECIES: | Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.) |
|-------------------------|--|
| (2) DENSITY: | Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks. |
| (3) REMOVALS: | Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headings listed. |
| (4) DISPOSITION OF FUR: | On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided. |
| (5) TOTAL POPULATION: | Estimated total population of each species reported on as of April 30. |
| REMARKS: | Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested. |

PUBLIC RELATIONS

(See Instructions on Reverse Side)

Refuge Quivira Nat'l. W/L RefugeCalendar Year 1967

1. Visits

a. Hunting 2,385 b. Fishing 00 c. Miscellaneous 1,890 d. TOTAL VISITS 4,275

1a. Hunting (on refuge lands)

TYPE	HUNTERS	ACRES	MANAGED BY
Waterfowl	<u>1485</u>	<u>6350</u>	
Upland Game	<u>900</u>	<u>6350</u>	
Big Game	<u>00</u>	<u>00</u>	
Other	<u>2</u>	<u>6350</u>	

Number of permanent blinds noneMan-days of bow hunting included above none

Estimated man-days of hunting on lands adjacent to

refuge 1000

1b. Fishing (area open to fishing on refuge lands)

TYPE OF AREA	ACRES	MILES
Ponds or Lakes	<u>none</u>	
Streams and Shores	<u>none</u>	

1c. Miscellaneous Visits

Recreation 1690 Official 75
 Economic Use 100 Industrial 25

2. Refuge Participation (groups)

TYPE OF ORGANIZATION	on refuge		off refuge	
	NO. OF GROUPS	NUMBER IN GROUPS	NO. OF GROUPS	NUMBER IN GROUPS
Sportsmen Clubs	<u>2</u>	<u>650</u>	<u>1</u>	<u>34</u>
Bird and Garden Clubs				
Schools	<u>7</u>	<u>267</u>	<u>5</u>	<u>217</u>
Service Clubs			<u>6</u>	<u>112</u>
Youth Groups			<u>1</u>	<u>470</u>
Professional-Scientific				
Religious Groups			<u>3</u>	<u>56</u>
State or Federal Govt.				
Other Saddle Club	<u>1</u>	<u>132</u>		

3. Other Activities

TYPE	NUMBER	TYPE	NUMBER
Press Releases	<u>3</u>	Radio Presentations	
Newspapers (P.R.'s sent to)	<u>8</u>	Exhibits	
TV Presentations		Est. Exhibit Viewers	

INSTRUCTIONS

Item 1: Total of a, b, and c, equal d.

"Visit" - definition. Any person who is on refuge lands or waters during a day or part thereof for the purpose of: hunting, fishing, bird-watching, recreation, business or economic use, official visit, or similar interest. INCLUDE - those who stop within the refuge while traveling on a public highway because of an interest in the area. EXCLUDE - persons engaged in oil or other industry not directly related to the refuge, persons using refuge as most direct route or principal avenue of traffic, and those boating on navigable rivers or the Intercoastal Canal, unless they stop to observe wildlife on the refuge.

Computing visits. Where actual counts are impractical, "sampling" is used with midweek and week-end samples varied by season or weather. A conversion factor of 3.5 (of passengers per car) is used when accurate figures are not available. Each refuge will develop a conversion factor for boats based on range of usage. Count a camper once for each 24-hour period or fraction thereof.

Item 1a: Acres - of refuge open for each type of hunting.

Managed hunts require check in and out of hunters, issuance of permits, or assignment of blinds.

Other - INCLUDE crow, fox, and similar hunting.

Lands adjacent to refuge. Normally considered within 1 mile or less of boundary, unless established sampling procedures cover a wider area. For big game hunting, the distance may be greater.

Item 1b: Acres of streams open to fishing, if practical; otherwise just miles open. Information on "shores" is primarily for coastal fishing.

Item 1c: Recreation. INCLUDE photography, observing wildlife, picnicking, swimming, boating, camping, visitor center use, tours, etc. TOTAL Recreation, Official, and Economic Use visits under Item 1.

Industrial. INCLUDE persons engaged in industry, i.e., oil industry or factories. EXCLUDE these from Item 1.

Item 2: INCLUDE the "On Refuge" groups in Items 1c and 1. In "Off Refuge" column include only those group meetings in which refuge employees actually participate. EXCLUDE these from Items 1c and 1.

Item 3: Exhibits - INCLUDE displays, fairs, parades, and exhibits OFF the refuge; EXCLUDE those ON.

(1)

NONAGRICULTURAL COLLECTIONS, RECEIPTS, AND PLANTINGS

Refuge Quivira National Wildlife Refuge Year 19 67

Collections and Receipts (Seeds, rootstocks, trees, shrubs)							Plantings (Marsh - Aquatic - Upland)						
Species	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Loss
							Darrynane Canal and Dikes and Ditches of Units 24, 40 and 62	6#/acre	10.19 miles of ditch bank and dike.	15# alfalfa 15# weeping love 30# sand love 45# switch	Early Spring	Fair to Good	
							Unit 49	20#/a.	5 acres	100# millet	July	Good	

- (1) Report agronomic farm crops on Form NR-8
(2) C = Collections and R = Receipts
(3) Use "S" to denote surplus

Total acreage planted:

Marsh and aquatic Approx. 15 acres

Hedgerows, cover patches

Food strips, food patches

Forest plantings

Remarks: Canal banks and ditches planted to prevent erosion.
Millet planted in Unit 49 for waterfowl food.

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Quivira National Wildlife Refuge County Rice State Kansas

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage	Green Manure, Cover and Water-fowl Browsing Crops Type and Kind	Total Acreage
	Acres	Bu./Tons	Harvested Acres	Bu./Tons	Unharvested Acres	Bu./Tons			
Wheat	60 a.	1,200 bu.	20 a.	400 bu.			80 a.	Planted and volunteer wheat available for browse. 80 a. volunteer wheat to be turned under for green manure in spring of 1968	160 a.
Milo	53 a.	1,590 bu.			27 a.	810 bu.	80 a.		
								Fallow Ag. Land	80 a.

No. of Permittees: Agricultural Operations 3 Haying Operations 0 Grazing Operations 2

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
None				1. Cattle	52	260	\$585.00	400 a.
				2. Other				
				1. Total Refuge Acreage Under Cultivation				240 a.
Hay - Wild	None			2. Acreage Cultivated as Service Operation				0

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

3-1758

Form NR-8

(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Quivira National Wildlife RefugeCounty StaffordState Kansas

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage	Green Manure, Cover and Water- fowl Browsing Crops Type and Kind	Total Acreage
	Acres	Bu./Tons	Harvested Acres	Bu./Tons	Unharvested Acres	Bu./Tons			
Winter Wheat	269 a.	1,800 bu.	89 a.	600 bu.			358 a.	500 acres of planted wheat plus approx. 80 acres volunteer wheat available for green browse.	
Winter Wheat (govt)					162 a.	1,200 bu.	162 a.		
Milo	159 a.	3,080 bu.			77 a.	1,540 bu.	236 a.		
Milo (govt)					115 a.	500 bu.	115 a.		
Rye (govt)					8 a.	120 bu.	8 a.	Fallow Ag. Land	365 a.

No. of Permittees: Agricultural Operations 5 Haying Operations 10 Grazing Operations 11

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
Alfalfa	16.5 tons	35 a.	\$49.50	1. Cattle	613	3,095	\$6963.75	4,820 a.
				2. Other				
				1. Total Refuge Acreage Under Cultivation				1,700 a.
Hay - Wild	630.23 ton	490 a.	\$970.40	2. Acreage Cultivated as Service Operation				575 a.

NR-8

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

REFUGE GRAIN REPORT

Refuge Quivira Nat'l. W/L Refuge

Months of January through December, 19567

(1) VARIETY*	(2) ON HAND BEGINNING OF PERIOD	(3) RECEIVED DURING PERIOD	(4) TOTAL	(5) GRAIN DISPOSED OF				(6) ON HAND END OF PERIOD	(7) PROPOSED OR SUITABLE USE*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Wheat	225 bu.	1,000 bu.	1,225bu.	620bu.	255bu.	50bu.	925 bu.	300 bu.		300 bu.	
Milo	650 bu.	-	650bu.	20bu.	-	330bu.	350 bu.	300 bu.		300 bu.	

(8) Indicate shipping or collection points _____

(9) Grain is stored at Refuge Bins

(10) Remarks _____

*See instructions on back.

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

- (1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR-9.
- (3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.
- (4) A total of columns 2 and 3.
- (6) Column 4 less column 5.
- (7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.
- (8) Nearest railroad station for shipping and receiving.
- (9) Where stored on refuge: "Headquarters granary," etc.
- (10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

DATE	OF RECEIVED		TOTAL	DISPOSED OF				TOTAL	DISPOSED OF		TOTAL
	ON HAND	RECEIVED		SEED	FEED	OTHER	LOAN		ON HAND	RECEIVED	
(1)	(2)	(3)	(4)	(5)				(6)	(7)		(8)

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

Refuge

Quivira Nat'l. W/L Refuge

ANNUAL REPORT OF PESTICIDE APPLICATION

Proposal Number

1-67

Reporting Year

1967

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
April-June	Russian Olive, Fremont Cottonwood, Tamarisk	Small cluster and individual trees around Darrynane Lake and various ditches and impoundments.	125 a.	2,4-D butyl ester	11 gal.	.50 A.E./A. estimated	1 gal/A. est.	Power and hand spray units.

10. Summary of results (continue on reverse side, if necessary)

Kill is good in most areas, however evaluation is difficult until the second year.

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PESTICIDE APPLICATION

Refuge

Quivira Nat'l. W/L Refuge

Proposal Number

2-67

Reporting Year

1967

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
May	Yellow Sweetclover	Tract 5	60a.	2,4-D butyl ester	15 gal.	1.0 A.E./a	1 gal/a.	Aerial Spray

10. Summary of results (continue on reverse side, if necessary)

Sprayed for control of yellow sweetclover in native hay. Successful kill.



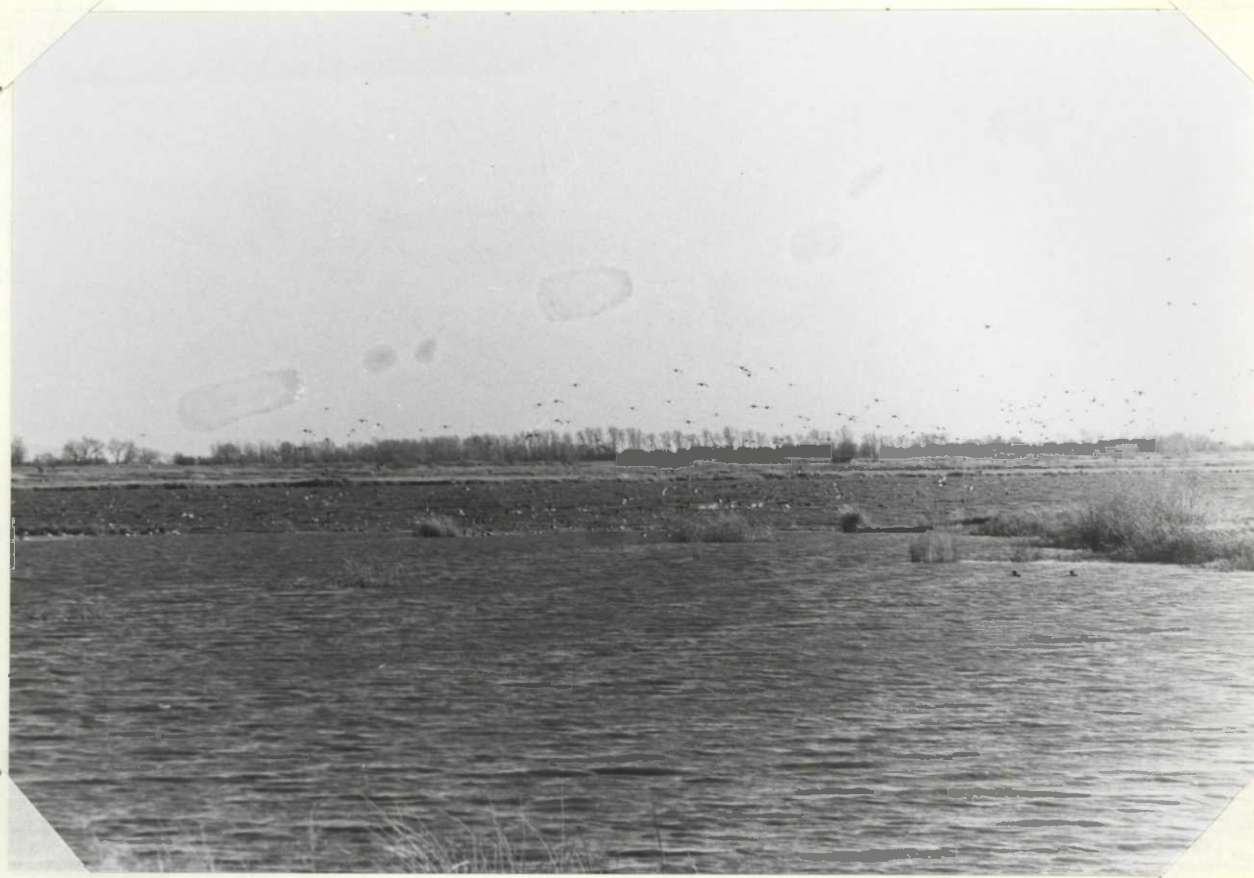
A dense algal growth was produced this summer on some units which had water for the first year. Units 28 and 29 were drained early in the summer. The heavy mat prevented the summer growth of seed producing forbs and grasses. 8/67 CRD



Rattlesnake Creek water control structure at Little Salt Marsh during winter freeze-up. Spraying water accumulated in massive ice formations. 12/67 JMC



Little Salt Marsh, 935 surface acres, during the winter freeze-up. Roughly 98% frozen over. 12/67 JMC



The west side of Little Salt Marsh was extensively utilized by mallards and Canada geese until the freeze-up in late December. This photo was taken from the road into the former Artesia Gun Club. The old Klepper Club is at least one mile across the marsh. 12/3/67 Courtesy of Sterling Bulletin.



The evening feeding flights leave the Little Salt Marsh. This area was part of the Hutchinson Gun Club prior to acquisition and renowned for waterfowl hunting. It remains in the Closed Area during the hunting season. 12/3/67 Courtesy of Sterling Bulletin.

CHRISTMAS BIRD COUNT

By Charles R. Darling, Refuge Manager
James M. Carroll, Jr., Asst. Refuge Manager
Wayne E. Dale, Refuge Clerk

Quivira National Wildlife Refuge, Stafford, Kansas, 38°09' N, 98°29' W.
(all points within a 15-mile diameter circle, center Refuge Sub-headquarters).
The Quivira Count area lies in NE Stafford, NW Reno and SW Rice Counties, Kansas.
Principal terrain features are Rattlesnake Creek, Little Salt Marsh and Big Salt Marsh. The creek enters the count area in the SW quarter of the circle, flows easterly into the Little Salt Marsh, thence northerly along the eastern side of the Big Salt Marsh. After leaving the Big Salt Marsh area, it flows easterly into the Arkansas River. The central part of the count area is rather flat and either of marsh type or with a very high water table. The east and west sides of the area are characterized by low sandhills and dunes, interspersed with ponds during wet seasons. Vegetative types are: Native tall grasses, marsh grasses, cottonwood and willow groves and scattered wheat and milo fields.

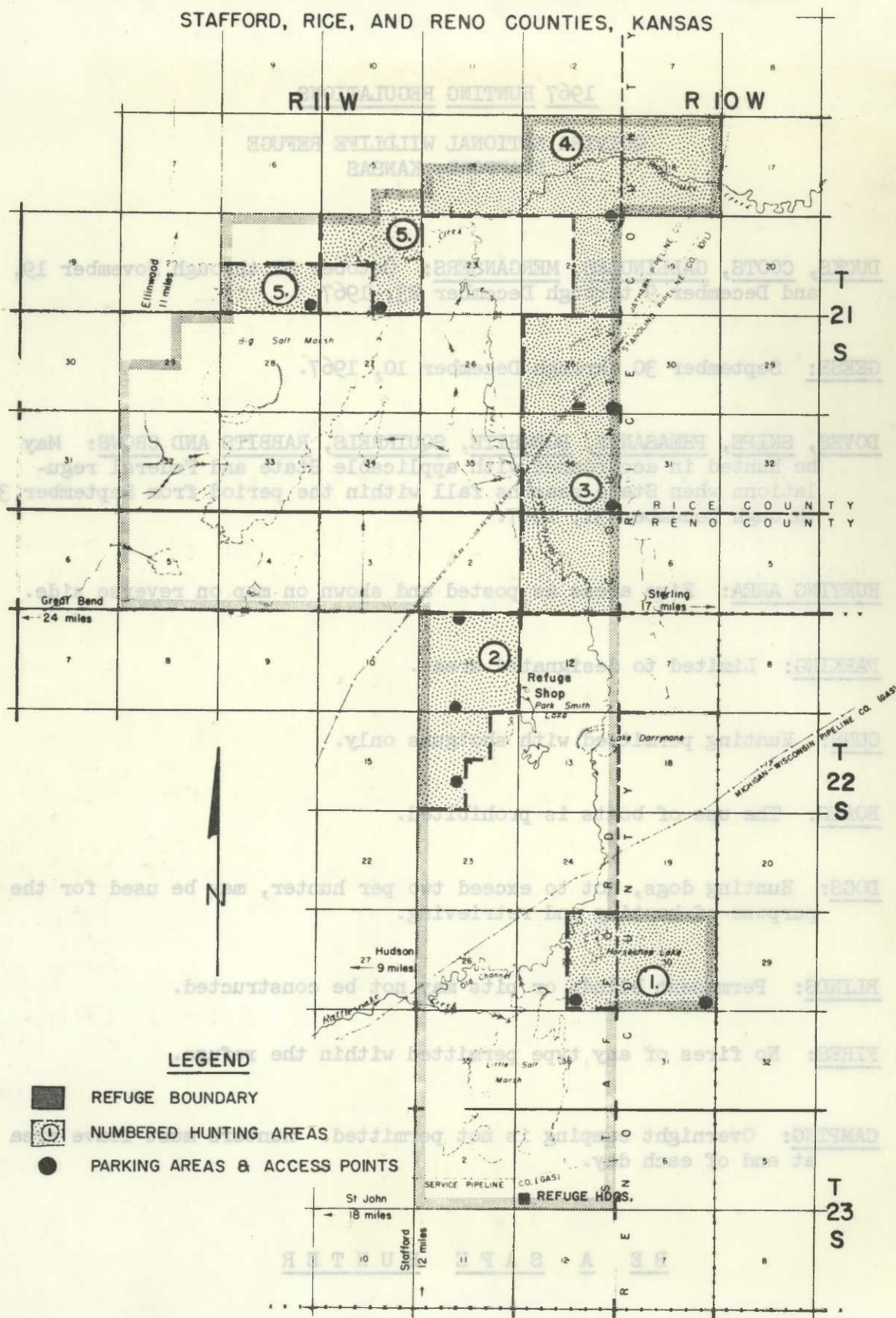
December 29, 1967; 7:30 a.m. to 4:00 p.m.; temp. 20°; wind - calm; cloudy with 4" snow cover; most water units ice covered. Three observers in two parties. Total party-hours 16; Total party miles 117, 1 on foot, 116 by vehicle.

Canada Goose	6,637	Belted Kingfisher	1
Snow Goose	1	Yellow-shafted Flicker	14
Mallard	81	Red-shafted Flicker	12
Pintail	19	Downy Woodpecker	2
Common Merganser	42	Blue Jay	2
Sharp Shinned Hawk	1	Crow	253
Cooper's Hawk	2	Black-capped Chickadee	45
American Roughleg	4	Loggerhead Shrike	1
Ferruginous Hawk	3	Starling	4
Golden Eagle	6	House sparrow	5
Bald Eagle	12	Eastern Meadowlark	413
Marsh Hawk	41	Red-winged Blackbird	24
Sparrow Hawk	7	Cardinal	7
Bobwhite	141	Purple Finch	1
Ring-necked Pheasant	84	Slate-colored Junco	10
Mourning Dove	2	Tree Sparrow	281
Horned Owl	1	Harris' Sparrow	63
Short-eared Owl	5		

35 Species

8,227 Individuals

STAFFORD, RICE, AND RENO COUNTIES, KANSAS



QUIVIRA NATIONAL WILDLIFE REFUGE

STAFFORD, RICE, AND RENO COUNTIES, KANSAS

1967 HUNTING REGULATIONS

QUIVIRA NATIONAL WILDLIFE REFUGE
STAFFORD, KANSAS

DUCKS, COOTS, GALLINULES, MERGANSERS: October 21 through November 19,
and December 9 through December 23, 1967

GEESE: September 30 through December 10, 1967.

DOVES, SNIPE, PHEASANTS, BOBWHITE, SQUIRRELS, RABBITS AND CROWS: May
be hunted in accordance with applicable State and Federal regu-
lations when State seasons fall within the period from September 30
through December 31, 1967.

HUNTING AREA: Five areas as posted and shown on map on reverse side.

PARKING: Limited to designated areas.

GUNS: Hunting permitted with shotguns only.

BOATS: The use of boats is prohibited.

DOGS: Hunting dogs, not to exceed two per hunter, may be used for the
purpose of hunting and retrieving.

BLINDS: Permanent blinds or pits may not be constructed.

FIRES: No fires of any type permitted within the refuge.

CAMPING: Overnight camping is not permitted. Hunters must leave area
at end of each day.

B E A S A F E H U N T E R

Hunting, Fishing

Three whooping cranes, two adults and a juvenile, are in the

area and will need protection, according to reports of the Oklahoma Department of Wildlife Conservation. Fred Bolwahn, manager of Salt Plains National Wildlife Refuge, spotted the birds Wednesday while conducting a routine waterfowl census. The whoopers are en route to the Arkansas National Wildlife Refuge, their winter haven, on the Texas coast.

Bolwahn believes the birds are the same ones spotted at the Kirwin National Wildlife Refuge in north-central Kansas, Tuesday. The three birds will travel through Oklahoma a short distance west of Oklahoma City. Bolwahn received a report from Arkansas Wednesday, indicating a dozen whoopers had already arrived. Another report from Stafford Kan., site of the Quivira National Wildlife Refuge, indicates four whoopers left Wednesday and headed toward Oklahoma.

Anyone sighting the rare birds should notify the Department of Wildlife in Oklahoma City, or any game ranger, of location and activity. Adults are large white birds, having black wing tips. They are similar to the white pelican in size. Juveniles are rust colored. Older birds flying with young must stop often, allowing the young birds to rest and feed. Whoopers are protected and hunters should be particularly alert for this endangered species. ...

THE TULSA WORLD

10/29/67

County is compensated for section lost to wildlife refuge

Rice county has received \$620.21 from C. R. Darling of the Quivira National Wildlife refuge in Stafford county, as a type of tax payment on a section of ground in the county which has been taken into refuge.

County Clerk Oscar Laudick explained that rather than paying a normal real estate tax, the federal government allows a sum that equals three-fourths of one percent of the valuation, as compensation for land that otherwise would produce local tax revenue. Presumably the payment will be a yearly event.

LYONS DAILY NEWS

9/30/67

NO NEW QUIVIRA PROJECTS

There will be no new projects started at Quivira Refuge this year, according to C. R. Darling, manager. In a talk to Stafford Rotarians Tuesday night, he said that no funds have been included for this purpose in appropriations. However, he said that the same thing is true of many other refuges in the country.

Needed funds for operation and general maintenance have been included in the budget, Mr. Darling said. This will assure keeping the refuge in good condition and proper upkeep of improvements already made.

And Mr. Darling expects that hunting and fishing will be permitted at the refuge before very long. Plans have been submitted and are already partially approved. There will be five areas designated for hunting.

Wild life population at the refuge is about normal for the time of year. There are about 300 geese and 7 - 8 thousand ducks. It is estimated there are now 70 deer. The number of eagles remains about the same.

STAFFORD COURIER

10/12/67

QUIVIRA FULL OF BIRDS

(Continued From Page 1)

a dike we found ourselves in the middle of a huge Prairiedog Town—said to be a "city" of more than 400 of these fascinating creatures. In all directions, curious little "dogs" sat upright on their mounds, not too concerned about the green and familiar to them, Quivira stationwagon.

Darling said there are four such "towns" within the Refuge.

Snowy plovers nest at the refuge. Mississippi kites are nesters and summer residents there.

The Refuge is manned by a staff of five, including Darling, his assistant, James Carroll, both of whom live in modern brick homes at Quivira headquarters; and Wayne Dale, clerk.

Management personnel are trained biologists, Darling holding a degree in zoology from Texas Tech at Lubbock. He has served with the Wildlife system for 14 years, coming here from the Wichita Mountain Refuge where he tended a large herd of buffalo and a herd of 300 Texas Longhorns.

Other tours of duty for Darling were at Waterfowl sanctuaries at Laguna Atascosa near San Benito, Texas; and at Havasu Lake, N.M. He has been head of Quivira for nearly two years.

Darling said Sunday he expects to open the same five areas, encompassing some 6,350 acres, to hunters again next year.

However, there is still much work to be done at Quivira. "Construction work at this point is only half completed," Darling explains.

Total surface water area in optimum years will eventually reach 5,000 acres.

Quivira is already a major waterfowl sanctuary in the migratory bird conservation program—and will become even bigger.

Quivira Alive With Waterfowl

Quivira National Wildlife Refuge, 22,000 acre haven for migrating ducks and geese, is again teeming with waterfowl. And as the Wildlife Service intended—the place is “strictly for the birds.”

Refuge Manager Charlie Darling, a 14-year veteran with the U.S. Fish and Wildlife Service, estimated Sunday that the present Refuge population is 60,000 Mallard Ducks, 2,000 to 3,000 other ducks such as Mergansers, plus 3,000 geese which are mostly small Canadians.

This is a good count for this time of the year and is an increase over December of 1966, although the population will increase as the weather becomes colder, Darling said. January of last year found some 80,000 birds in the area, the manager stated.

Interest in the Quivira project has been heightened this fall with the opening of five areas for hunting—first since the Refuge was established in 1956.

“The hunting program has proved satisfactory in its initial year,” Darling said Sunday. Hunters have observed the regulations and at the same time have had good shooting, he stated. In addition to the waterfowl, hunters have made good kills of pheasant and quail—especially those hunting with dogs. Heavy grass makes the birds difficult to flush without a dog.

Commenting on the heavy grass, Darling expressed relief that no fires had occurred. “We can’t caution hunters too strongly on this point,” he adds.

Originally known simply as the “salt marsh,” the Quivira area has long been recognized as one of the best duck and geese hunting grounds in the state. Before the turn of the century it was actually the scene of “commercial” hunting, with meat-hungry professionals mowing down the ducks with eight-gauge “cannon” mounted on the gunwales of crude hunting boats. Barrels of frozen birds were shipped to Kansas City and Chicago for consumption in the fancy hotels and restaurants of those cities.

Quivira is now one of three National Wildlife sanctuaries operated in Kansas. All are for

migratory birds. Others are located at Kirwin and in the Flint Hills.

First established in the mid-1950s, Quivira has been the scene of extensive engineering work and biological surveys in the way of bird counts and identification.

Teams of biologists have actually recorded the sighting of some 243 species in the area—some common, some rare.

After the land was first acquired, dozens of canals were dug, spillways built and other construction work begun with a view to making best use of the 2,000 acres of water included in the site.

Main source of water is Rattlesnake Creek which heads 80 miles southwest and enters the refuge in the “Little Marsh,” once the location of such well-known hunting headquarters as Darrydane, the Hutchinson Gun Club, Artesian Gun Club and the Ellinwood Gun Club. These clubs are no longer in operation, although the buildings are still standing.

The Refuge includes open water, marshes, rangeland, farmland and low sandhills. Located on the Central Flyway, its chief function is in the conservation of international waterfowl resource.

Fed from the Little Marsh are dozens of small, grass-rimmed shallow-water units which provide the favorite haunts for the waterfowl. It is in these small “pot-holes” and not on the main Marsh that the birds settle down for feeding and for noisy gatherings which Manager Darling describes as “duck parties.”

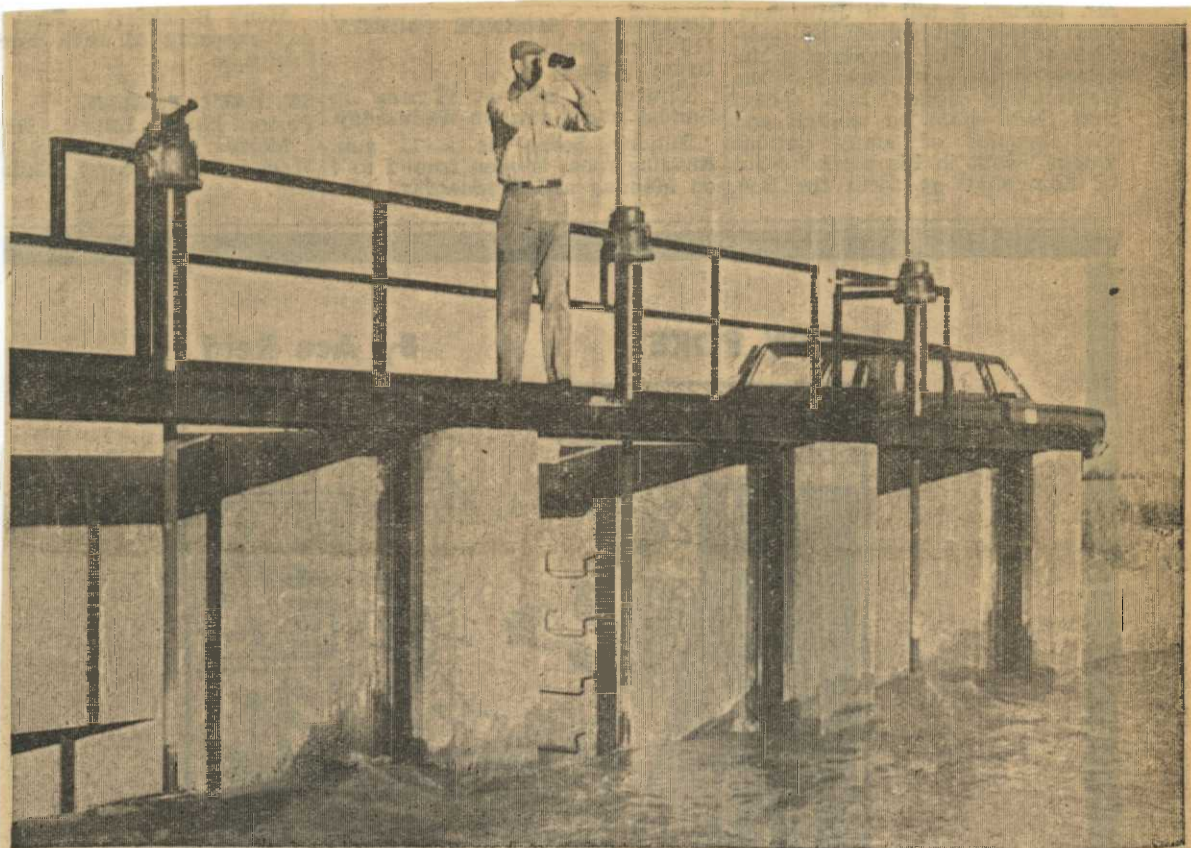
Waterfowl numbers build up from the first of October to December and the spring migration starts early in February, reaching a peak in March.

Spring and fall populations of white pelicans and Franklin’s gulls are common.

Driving the edge of the Little Marsh on roads open to Refuge personnel only, we stopped near a dead cottonwood in the top of which was a large Bald Eagle. Darling pointed out a grove, said to be the winter home of a dozen eagles, mostly immature Bald and several Golden.

Wildlife is not confined to birds. Deer are common. Rising up over

(Continued on Page 5)

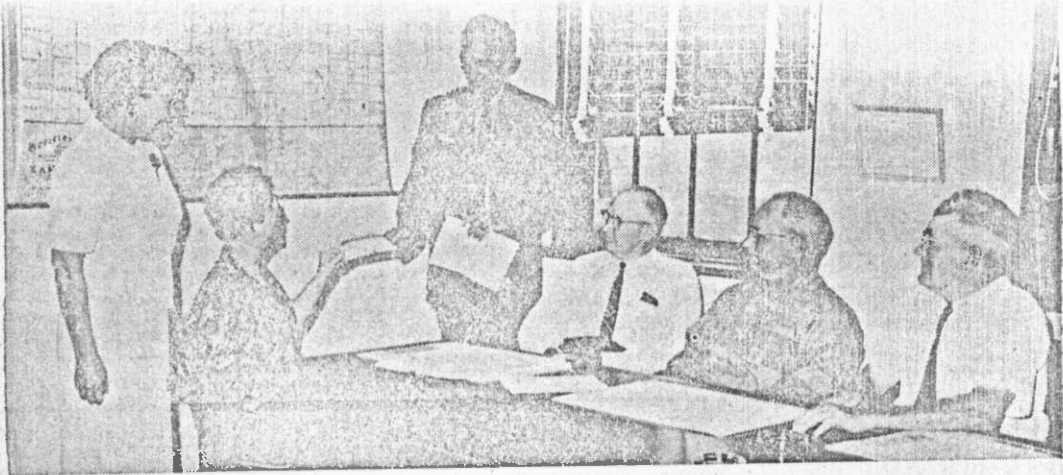


Charlie Darling, Manager of the Quivira National Wildlife Refuge, located 17 miles southwest of Sterling, scans the Little Marsh as he makes a waterfowl count. The cement floodgate is located at the north end of the Little Marsh and is used to control waterflow into Rattlesnake Creek as it flows northward into the Big Marsh. Little Marsh is three feet deep in many places, Darling said.



At feeding time this is a common scene at Quivira as the more than 65,000 ducks and geese move about for forage.

STERLING BULLETIN
12/07/67



GOOD NEWS FOR SCHOOLS, ROADS — Stafford County officials, last week, received a check for \$16,753.05 from Charles Darling, Quivira Refuge manager, to be used for county schools and roads. From left to right are:

Pauline Duer, Florence DeSelms, Charles Darling, Bill Siefkes, Ward Beaver and Wm. Wallace.

(St. John News Photo)

Quivira Wildlife Refuge Will Be Opened To Public Hunting Until End Of Dec.

STAFFORD
COURIER
10/19/67

Five areas have been approved for public hunting use on the Quivira National Wildlife Refuge. The five areas comprise 6,350 acres of the 20,000 acre refuge. Maps of the hunting areas are available at the refuge office, 13 miles northeast of Stafford.

Public hunting will be permitted on these areas for ducks, geese, coot, gallinule, snipe, mourning dove, ring-necked pheasants, bob white, cottontail rabbits, squirrel and crows in accordance with state regulations through December 31, 1967, except that no rifles are permitted for taking squirrel, rabbits and crows. It is unlawful to shoot any other birds or mammals on the refuge. It is not necessary to check in or out of the hunting areas.

The Quivira National Wildlife Refuge was authorized by the Migratory Bird Commission in 1955 and land acquisition began in 1956. Acquisition and development have been in process since that time. The construction of about fifty percent of the proposed water units has been completed.

The Quivira Refuge supplies an important resting area for ducks and geese during their fall and spring migration flights. Waterfowl use has steadily increased since the early days of acquisition. The retirement of marginal agricultural land and conversion to grassland has improved conditions for upland game. Quail and pheasant hunting is expected to be very good on most of the hunting areas.

ST. JOHN NEWS
10/19/67

Refuge Help To Schools, Roads

Charles Darling, in charge of Quivira Wildlife Refuge, presented a check in the amount of \$16,753.05 to the County of Stafford Monday morning this week, as the annual payment in accordance with the Refuge Revenue Sharing Act, as amended.

County Treasurer Florence DeSelms accepted the check for the county, in the presence of the County Commissioners and County Clerk Pauline Duer.

Payment to Stafford county is made on the basis of 19,611 acres of acquired lands in the Quivira National Wildlife Refuge, for the period of July 1, 1966, to June 30, 1967.

The law provides that the payment may be made either on the basis of 25 per cent of refuge receipts, or three fourths of one per cent of the adjusted cost of the acquired lands — whichever is greater.

The money may be used only for use of schools and or roads within the county.

Quivira was authorized by the Migratory Bird Commission in 1953 and land acquisition began in 1956; Funds for the land acquisition were derived from the sale of "Duck Stamps," which are required for the lawful hunting of ducks and geese.

STAFFORD
COURIER
10/12/67

THE *Horseman's*
30¢ *Herald*

VOL. 2 DEC. 1967 - JAN. 1968 NO. 9

*Over 170 Begin
Annual Duggan-
Hamilton Ride*



One hundred and sixty two signed the guest book at the Duggan-Hamilton trail ride. Many missed signing. One hundred and forty six horses with rider representing 27 towns began the all day ride. Della Duggan reports this to be a marvelous turn out considering the blistery cold and wet weather.

The day started out with promising weather at the 7 a.m. breakfast on October 29. Then around 8 o'clock everyone was looking for extra clothing. About 10 o'clock, after an hour on the trail we were getting wet. Several turned back or called it a day when the group broke for lunch. It was reported eighty-seven rode in at the Hamilton ranch to end the day-long ride.

The ride began near Hudson, Kansas, west of Hutchinson on the Ted Duggan ranch. It took riders through the nearby wildlife refuge and the white marsh lands continuing over rough land and seldom traveled back roads. Riders say many game birds and miles of beautiful country. Some tried to take their mind off the cold by running down a coyote! Others played tag on horseback. Some rode bareback for a warmer ride. All enjoyed the warm fire, weiner roast and hot chili at the end of the day.

Ted and Della Duggan with Dean and Jack Hamilton together sponsored the trail ride.

